Math 4610.001: Spring 2018

Meets: TR 2:00-3:20 in Hickory Hall, Room 252.

Instructor: Professor John Quintanilla

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Office Phone: x4043

E-mail: jquintanilla@unt.edu

Web page: http://www.math.unt.edu/~johnq/Courses/2018spring/4610/

Office Hours: Mondays 9-1 or by appointment.


Strongly Recommended: Lecture notes for the semester are available for approximately $14 from the Eagle Images Print Center, located in room 221 of the University Union.

Course Description: Combinatorial analysis, probability, conditional probability, independence, random variables, expectation, generating functions and limit theorems.

Prerequisite: Math 2730 and 3680. Note: I have made certain videos from my Math 3680 class available on Blackboard for anyone who would like a more thorough discussion or review of these concepts.

Actuarial Exams: Math 4610 should provide good preparation from the 1/P actuarial exam. More about the actuarial profession can be found at http://www.beanactuary.org, including extensive preparation for the 1/P exam that can also serve as review material for this course.

Course Topics

The following chapters and sections of the textbook will be covered according to the projected schedule below. Dates may change as events warrant.

- Chapter 1: Introduction
  - 1.1 Equally Likely Outcomes
- 1.2 Interpretations
- 1.3 Distributions
- 1.4 Conditional Probability and Independence
- 1.5 Bayes' Rule
- 1.6 Sequences of Events
- Chapter 2: Repeated Trials and Sampling
  - 2.1 The Binomial Distribution
  - 2.2 Normal Approximation: Method
  - 2.4 Poisson Approximation
  - 2.5 Random Sampling
- Chapter 3: Random Variables
  - 3.1 Introduction
  - 3.2 Expectation
  - 3.3 Standard Deviation and Normal Approximation
  - 3.4 Discrete Distributions
  - 3.5 The Poisson Distribution
- Chapter 4: Continuous Distributions
  - 4.1 Probability Densities
  - 4.2 Exponential and Gamma Distributions
  - 4.4 Change of Variable
  - 4.5 Cumulative Distribution Functions
  - 4.6 Order Statistics
- Chapter 5: Continuous Joint Distributions
  - 5.1 Uniform Distributions
  - 5.2 Densities
  - 5.3 Independent Normal Variables
  - 5.4 Operations
- Chapter 6: Dependence
  - 6.1 Conditional Distributions: Discrete Case
  - 6.2 Conditional Expectation: Discrete Case
  - 6.3 Conditioning: Density Case
  - 6.4 Covariance and Correlation
  - 6.5 Bivariate Normal

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<tr>
<th>Date</th>
<th>Lecture #1</th>
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<th>Review of Probability from Math 3680</th>
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<td>4.1 Continuous random variables</td>
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<td>4.1, 4.2 Exponential and gamma distributions</td>
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<td>March 8</td>
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<td>4.4 Change of variable</td>
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### SPRING BREAK

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#### Student Responsibilities

- Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student's conduct violated the [Code of Student Conduct](#).

The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc.

- You should read over this syllabus carefully, as I will hold you responsible for the information herein.
- Students will be expected to read the chapters carefully, including the examples in the book.
- Students will be responsible for obtaining any and all handouts. If you are not in class when handouts are given, it is your responsibility to obtain copies.

**You should begin working now.** Frequent practice is crucial to the successful completion of a mathematics course. Cramming at the last minute will certainly lead to failure.

**WARNING:** If you are in academic trouble, or are in danger of losing your financial support, or if your parent or guardian is expecting a certain grade at the end of the semester... start working today. I will refuse to listen to any pleas at the end of the semester. You will receive precisely the grade that you earn.

### Grading Policies

The following schedule is tentative and is subject to capricious changes in case of extracurricular events deemed sufficiently important to the upper administration.
Cooperation is encouraged in doing the homework assignments. However, cheating will not be tolerated on the exams. If you are caught cheating, you will be subject to any penalty the instructor deems appropriate, up to and including an automatic F for the course.

Attendance is not required for this class. However, you will be responsible for everything that I cover in class, even if you are absent. It is my experience that students who skip class frequently make poorer grades than students who attend class regularly. You should consider this if you don't think you'll be able to wake up in time for class consistently.

The grade of "I" is designed for students who are unable to complete work in a course but who are currently passing the course. The guidelines are clearly spelled out in the Student Handbook. Before you ask, you should read these requirements.

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**Exam Policies**

- I expect to give exams during the weeks above, but these dates are subject to change.
- After exams are returned in class, you have 48 hours to appeal your grade. I will not listen to any appeals after this 48-hour period.
- I will not drop the lowest exam score; all will count toward the final grade.
- No make up exams will be given. For those students who miss an exam due to an Authorized Absence (see the Student Handbook), the final grade will be computed based only on those exams taken, together with homework/quiz scores and the final exam. Such students will be required to provide official written verification of such an absence.
- Students missing an exam for unauthorized reasons will receive 0 (zero) points on the exam.
- The Final Examination will be comprehensive in the sense that problems may come from any of the sections that will be covered during the semester.
- The grade of A signifies consistent excellence over the course of the semester. In particular, an A on the final is not equivalent to an A for the course.
- I reserve the right to test and quiz you on problems which are generalizations of material covered in the class and/or in the text. In short, the problems may not look exactly like the ones in the book.
- Everything that I say in class is fair game for exam material. You will be responsible for everything unless I advise you to the contrary.
Homework Policies

- Homework will be assigned every Thursday and will be due the following Thursday.
- I expect the assignments that you turn in to be written up carefully and neatly, with the answers clearly marked. You must show all of your work. Messy homework will not be accepted.
- Entire homework assignments will not be graded. Instead, only 3-5 representative problems will be graded per assignment. As a consequence, it will be possible to not do the entire assignment and still receive a perfect score on that particular assignment. Deliberately leaving homework uncompleted is highly unrecommended, however, as the law of averages will surely catch up with you as the semester progresses.
- When computing grades, I will drop the two lowest homework grades before computing the homework average. Therefore, in principle, you could get a 100% homework score and also not turn in two assignments during the semester. I have this policy in case you get sick, a family emergency arises, etc., during the semester. You will still be responsible for the material in such assignments during the examinations.
- Because of this policy, I will not give extensions on homework assignments, nor will I accept late assignments.

Final Note

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda. You may also contact them by phone at 940.565.4323.