MATH 3382 SYLLABUS FOR Fall 2018

UTRGV Course title and number: **Actuarial Probability Models - 28362 - MATH 3382 - 04I**

Term: Fall 2018

Instructor Name: Dr. Demba Fofana

Telephone #: 956 – 381 – 2263,

Email: demba.fofana@utrgv.edu

Meeting times and location: **TR 4:30 pm - 5:45 pm, Edinburg LIBERAL ARTS BUILDING SOUTH 185 or Brownsville LIFE & HEALTH SCIENCES #61 2.312**

Office hours and location: MW 11:00 a.m. – 12:00 noon or by appointment MAGC 3.204


Learning Objectives/Outcomes for the Course

Upon completing this course, students will have the ability to:

1. **Understand General Probability**
   a) Define set functions, sample space, and events. Define probability as a set function on a collection of events and state the basic axioms of probability.
   b) Calculate probabilities of mutually exclusive events.
   c) Calculate probabilities using the addition and multiplication rules.
   d) Define independence and calculate probability of independent events.
   e) Calculate probabilities using combinatorics, such as combinations and permutations.
   f) Define and calculate conditional probabilities.
   g) State Bayes Theorem and use it to calculate conditional probabilities.

2. **Univariate Random Variables**
   a. Explain and apply the concepts of random variables, probability and probability density functions, and cumulative distribution functions.
   b. Calculate conditional probabilities.
   c. Explain and calculate expected value, mode, median, percentile, and higher moments.
   d. Explain and calculate variance, standard deviation, and coefficient of variation.
   e. Define probability generating functions and moment generating functions and use them to calculate probabilities and moments.
   f. Determine the sum of independent random variables (Poisson and normal).
   g. Apply transformations.

3. **Multivariate Random Variables**
   a. Explain and perform calculations concerning joint probability and probability density functions and cumulative distribution functions.
   b. Determine conditional and marginal probability and probability density functions, cumulative distribution functions.
   c. Calculate moments for joint, conditional, and marginal random variables.
   d. Explain and apply joint moment generating functions.
   e. Calculate variance and standard deviation for conditional and marginal probability distributions.
   f. Calculate joint moments, such as the covariance and the correlation coefficient.
   g. Determine the distribution of a transformation of jointly distributed random variables. Determine the distribution of order statistics from a set of independent random variables.
   h. Calculate probabilities and moments for linear combinations of independent random variables.
i. State and apply the Central Limit Theorem.

HOMEWORK:
Reading assignments and homework problems will be assigned. Use latex or Scientific Word to write your homework. Download latex: https://miktex.org/download and TexSudio at https://www.texstudio.org/

EXAMS/GRADE POLICY:
Your course grade will be based on homework (25%), three exams (30%), a comprehensive final exam (30%) and a research project (15%).

Calendar of Activities

August 30 Last day to add a course or register for fall 2018
September 3 Labor Day – NO classes
November 14 Last day to drop a course; will count toward the 6-drop rule
November 22 - 24 Thanksgiving Holiday – NO classes
December 6 Study Day – NO classes
December 7 - 13 Final Exams

ATTENDANCE:
Class attendance is mandatory, and any absences should be discussed with the instructor in advance. Any student who misses a class is responsible for borrowing the material covered during his/her absence, from a classmate. Any student missing three lectures may be DROPPED from the class. Attendance and class participation may be used to determine grades in borderline cases.

CLASS CONDUCT:

NOTE: Walking into class late or walking in and out of class during lectures are disruptive behaviors which distract the attention of the teacher and other students. Also, a student who walks in and out of class during lectures misses some important facts about the lecture being delivered.

1. Any student who comes to class late after the roll has been checked is regarded as absent from class that day. The class roll is checked at the beginning of the class period and not at the end.

2. You may be DROPPED from the course for excessive lateness.

3. You MUST stay in class till the end of the period.

   a. A student will be checked absent from class if the student leaves before the period ends.

   b. If a student walks in and out of the classroom while lecture is in progress, regardless of the reason, 2 points will be deducted from the final grade because walking in and out of the class during lectures is disruptive. Exceptions will only be made for documented medical reasons.

4. All cellular phones and beepers must be turned off during class time. 5 points will be deducted from your final grade if your cellular phone or beeper rings in class, whether accidentally or deliberately.

5. Any disruptive or unruly behavior will be grounds for dismissal from the course.

6. Any student caught cheating on any of the exams will be given a course grade of F.
STUDENTS WITH DISABILITIES:

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus**: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus**: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu/home); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:

In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**Tentative Schedule of Activities:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Days</th>
<th>Date</th>
<th>Topics</th>
<th>Student Activities</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>8/28/18 to 9/3/18</td>
<td>Ch1. Introduction to Probability Theory</td>
<td>week 1 Assignments</td>
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<tr>
<td>2</td>
<td></td>
<td>9/5/18 to 9/10/18</td>
<td>Ch1. Introduction to Probability Theory</td>
<td>week 2 Assignments</td>
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<tr>
<td>Week</td>
<td>Dates</td>
<td>Chapter/Section</td>
<td>Notes</td>
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<td>3</td>
<td>9/11/18 to 9/17/18</td>
<td>Ch2. Random Variables</td>
<td>week 3 Assignments</td>
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<td>4</td>
<td>9/18/18 to 9/24/18</td>
<td>Ch2. Random Variables</td>
<td>week 4 Assignments</td>
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<td>5</td>
<td>9/25/18 to 10/1/18</td>
<td>Ch2. Random Variables</td>
<td>week 5 Assignments</td>
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<td>6</td>
<td>10/2/18 to 10/8/18</td>
<td>Ch2. Random Variables</td>
<td>week 6 Assignments</td>
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<tr>
<td>7</td>
<td>10/9/18 to 10/15/18</td>
<td>Ch3. Conditional Probability and Conditional Expectation</td>
<td>week 7 Assignments</td>
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<td>8</td>
<td>10/16/18 to 10/22/18</td>
<td>Ch3. Conditional Probability and Conditional Expectation</td>
<td>week 8 Assignments</td>
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<td>9</td>
<td>10/23/18 to 10/29/18</td>
<td>Ch3. Conditional Probability and Conditional Expectation</td>
<td>week 9 Assignments</td>
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<td>10</td>
<td>10/30/18 to 11/5/18</td>
<td>Ch5. The Exponential Distribution and the Poisson Process</td>
<td>week 10 Assignments</td>
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<td>11</td>
<td>11/6/18 to 11/12/18</td>
<td>Reviews</td>
<td>week 11 Assignments</td>
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<tr>
<td>12</td>
<td>11/13/18 to 11/20/18</td>
<td>Exams</td>
<td>week 12 Assignments</td>
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TENTATIVE EXAM DATES:

Exam 1: Thursday, September the 27th
Exam 2: Thursday, October the 25th
Exam 3: Tuesday, November the 20th
Final Exam: Between December the 7th and 13th

Inclement Weather:
Deadline extensions because of inclement weather, or any other unforeseen event will be considered as needed. It is the student’s responsibility to communicate such need as soon as possible.

Syllabus Changes:
This course syllabus provides a general plan for the semester; in the interest of flexibility, there may be necessary deviations, at my discretion.