Welcome! If you are joining us this summer for this course, I warmly welcome you. This syllabus is to outline the purpose of this course, Math 3160 (Probability), and to give you a guide on what you will learn from this course, and how to do extremely well. For many of you, this may be your first formal course in probability. Whatever field of study you are intending to pursue, you will find this course quite useful, and despite its mathematical rigor, there are many interesting intuitions that we can altogether develop so that we will also have better appreciation of it when applied to our everyday lives. Consider listening to the news recently: “In a gathering of 10 or more people, there is a 30% chance of at least one attendee having the virus.” “The vaccine efficacy rate is 90%.” “Only 1 in 2,000 such cases happen.” “In all likelihood, my sister will outlive me.” “The average stock market is historically 10% annually before inflation.” There are many other and more complicated scenarios we face everyday that involve risks and uncertainties, and the hope is that we go through this journey of learning together so that after this course, we will have better appreciation and understanding of this concept called “probability.”

Course Syllabus – Summer Session II 2021

Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus is located within the course in HuskyCT.

Course and Instructor Information

Course Title: MATH 3160 (Probability)
Credits: 3
Format: Distance Learning
Prerequisites: MATH 2110 or 2130 or 2143. Cannot be taken for credit after passing MATH 3165, 3610, 3621, 3634, 4735.

Professor/Instructor/Facilitator: Emil Valdez (preferred name address is Emil)
Pronouns: he/him/his
Website: Kindly visit my website to learn more about my teaching and other professional activities: http://www2.math.uconn.edu/~valdez/

Email: emiliano.valdez@uconn.edu
Telephone: 860-486-6331
Office Location: Monteith 439
Office Hours/Availability: Wednesdays, 1:00pm-3:00pm, by appointment (email preferably)
WebEx Personal Room: https://uconn-cmr.webex.com/meet/emv07002

Course Materials

Required course materials should be obtained before the first day of class.

There is one required textbook that will be our primary source of reference. This manual/textbook is the work of a group of experts from our Department of Mathematics designed to provide resource materials for this course, MATH 3160.

Optional Materials:
The above textbook/reference will be supplemented with slides, annotations, and several exercises and examples freely available throughout the semester in HuskyCT. They will become available as the material is covered.

Any other additional course readings and media will be made available within HuskyCT, through either an Internet link or Library Resources.

Course Description

Course Description from Course Catalog. Introduction to the theory of probability. Sets and counting, probability axioms, conditional probabilities, random variables, limit theorems.

Course Delivery

While this course is listed as “Distance Learning” with a synchronous schedule, we will try to experiment together on how best to provide the most effective and enjoyable way to learn this course, as efficiently as possible. You will see some mathematics and proofs to provide you the necessary scientific rigor as you further pursue more advanced studies with applications of this course. I would also like to give you as much intuition to the materials we learn each day, so that they become practicable to your everyday lives. Some examples will be boring, but hopefully, some examples will be drawn from news and readings and discussions you may have heard elsewhere. Here are some important highlights (these may change if we find that some of them are ineffective, or some suggestions from the class are much more effective):

- Pre-recorded video lectures of about 45 minutes will be provided a day or two before each class. In the beginning, we will go through these pre-recorded video lectures together; I will play the video, pause when someone wants to ask a question, or pause when I want to highlight important concepts. Later this exercise may become unnecessary at which point, you will then be responsible to listen to the pre-recorded video lectures so that our synchronous schedule will become more asynchronous.

- At each scheduled meeting, I will always begin with some summary of the concepts from the previous class, and possibly summary of concepts to learn for the day.

- For the rest of each scheduled meeting, we will discuss additional materials highlighted with illustrative examples to reinforce and apply important concepts or provide more scientific proofs of important results. And yes, whenever possible, these will be recorded for later reference. Any slides and annotations will be provided in HuskyCT at the end of each class.

- You are expected to solve assigned problems from the recommended reference, and any additional supplementary exercises provided.

- All video materials, supplements, solved exercises, and annotations will be provided in HuskyCT.

Recording Lectures

Classes for this semester’s course will be conducted from time to time. As the host, I may record these sessions using WebEx’s recording feature. I will let the class know at the beginning of a session if I plan to record the session. The recording feature for others in attendance will be disabled so that no one else will be able to record a session. In order to protect student privacy and intellectual property rights, students are prohibited from recording any session, or any portion of a session, by other means. At my discretion and in accordance with University policies and guidelines, I may share one or more of the recorded sessions with the class to provide students with an additional opportunity to review course content. The sharing of any recorded content without my written permission is prohibited. If you would like to ensure your likeness is not captured during an online class, please turn your camera off. For recordings conducted in person, please alert me to any concerns so that I may take steps to help ensure you are not recorded.

Please remember that the unauthorized recording or sharing of course content may be considered a violation the law, University policy, and/or The Student Code.
The web-based video delivery of each class in this course is for sole use of the students enrolled in this course. Any other use of these class videos or any pictures or derivatives of the class videos without the written consent of the course’s professor is prohibited.

Course Objectives

By the end of the semester, you should be able to:

1. Understand the meaning of event, outcome, and sample space, and understand the basic calculations of probability of events including those with complicated outcomes.
2. Explain basic axioms in probability and principles involving laws for unions, intersections, complement, and independence, as well as the Bayes theorem and recognize situations where Bayes is applied.
3. Explain basic concepts of random variables including distinction among discrete, continuous, and mixed random variables; compute and interpret means and higher moments, variance, and covariance of random variables.
4. Describe density and distribution functions of a random variable, and be able to compute one, given the other. Define familiar distributions such as binomial, uniform, Poisson, negative binomial, exponential, Gamma, Beta, and normal random variables. recognize situations where a familiar distribution may be applied.
5. Explain the meaning and definition of a moment generating function and why they are useful for understanding distributions of random variables.
6. Apply the concepts of probability in real life situations and precautions about the differences in terms used that similarly look like probability, such as “odds”, “likelihood”, “efficacy”, “chances”, “conceivable”.

Course Requirements and Grading

Summary of Course Grading:

The following table gives the relative weightings of the assessment components to arrive at your final grade.

<table>
<thead>
<tr>
<th>Course Components</th>
<th>Weight</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Participation</td>
<td>15%</td>
<td>Throughout the semester</td>
</tr>
<tr>
<td>Class Test 1 (45 min.)</td>
<td>20%</td>
<td>Thu, July 15</td>
</tr>
<tr>
<td>Class Test 2 (45 min.)</td>
<td>20%</td>
<td>Thu, July 22</td>
</tr>
<tr>
<td>Class Test 3 (45 min.)</td>
<td>20%</td>
<td>Thu, July 29</td>
</tr>
<tr>
<td>Final Examination (1 hour)</td>
<td>25%</td>
<td>Thu, Aug 12</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Class Participation
This will vary from being called in class, asking questions, and possibly assigned problems to make up for missing classes when called. When called, you will not be graded based on the accuracy of your answers, but in the manner you reason out for your answers.

Class Tests
There are 3 class tests, with each to be conducted at the end of each week during the first three weeks. These will test your understanding materials we all learn together during the week. Only materials covered in class, or in video lectures, will be examined. To give you more flexibility, I will take your two highest class test scores and weigh them equally with 30%; use that score if that leads to a better grade.

Final Examination
The final examination will be heavily emphasized with the later materials after the three class tests, though understanding of earlier materials are necessary to understand later materials. In the usual terminology, the final examination is not necessarily cumulative.

For additional information on undergraduate grading policies see here: https://registrar.uconn.edu/grades/

For additional information on graduate grading policies see here (note that effective Fall, 2020, the grade of A+ no longer exists) https://gradcatalog.uconn.edu/grad-school-info/academic-regulations/#Grades
Grading Scale: (Your total weighted grade will be rounded up.)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Letter Grade</th>
<th>GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>87-89</td>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>84-86</td>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>81-83</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>78-80</td>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>75-77</td>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>70-74</td>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>65-69</td>
<td>C-</td>
<td>1.7</td>
</tr>
<tr>
<td>60-64</td>
<td>D+</td>
<td>1.3</td>
</tr>
<tr>
<td>55-59</td>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>50-55</td>
<td>D-</td>
<td>0.7</td>
</tr>
<tr>
<td>&lt;50</td>
<td>F</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Due Dates and Late Policy

On the day of the class test, the exam will be available to you in HuskyCT. I will guide you where to download the exam questions, just prior to 10:15am. You are expected to send me a copy of your solutions, in pdf format. You may use a scanner to save your solution in pdf, or take a photo of your exam via a mobile app (e.g., CamScanner for iPhone or similar mobile). The use of CamScanner is highly recommended. Each test will be due at the end of the scheduled lecture for the day, i.e., 11:15am. Each test must be emailed to me with a stamped time of 11:15am or earlier.

On the final examination date, the exam will be provided at the 9:30am; again I will guide you prior to that where to download the exam.

More details will be provided in class. The instructor will be happy to accommodate special needs such as illness on day of exam/test, any time zone differences. The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.

Feedback and Grades

I will make every effort to provide feedback and grades immediately on the first day of the following week of the test. To keep track of your performance in the course, refer to My Grades in HuskyCT.

Weekly Time Commitment

To perform extremely well in this course, in addition to the synchronous schedule, you should expect to dedicate 8 to 10 hours a week to this course. This expectation is based on the various course activities, assignments, and assessments and the University of Connecticut’s policy regarding credit hours. (More information related to hours per week per credit can be accessed at the Online Student website).

For Distance Learning (DL) and Online (WW) Courses Only: Student Authentication and Verification

The University of Connecticut is required to verify the identity of students who participate in distance learning and online courses and to establish that students who register in an online course are the same students who participate in and complete the course activities and assessments and receive academic credit. Verification and authentication of student identity in this course will include: Secure access to the learning management system using your unique UConn NetID and password.

Tentative Class Schedule

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Week Beginning</th>
<th>Topics Covered</th>
<th>Assessment</th>
</tr>
</thead>
</table>

How to Succeed in this Course

My teaching philosophy is that we will all learn the materials together. Everyone can succeed in this course and I will always be here to help you along the way. Please do not hesitate to ask questions or attend office hours. All questions are important here. Success in this course program depends heavily on your personal health and well-being. Recognize that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. I strongly encourage you to reframe challenges as an unavoidable pathway to success. Reflect on your role in taking care of yourself throughout the semester, before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having that may impact your performance in your courses or campus life as soon as it occurs and before it becomes too overwhelming. In addition to your academic advisor, I strongly encourage you to contact the many other support services on campus that stand ready to assist you.

If you feel necessary and your needs arise, please consider seeking help from these various departments and offices of the university: Dean of Students Office, Academic Achievement Center, Writing Center, Quantitative Learning Center, Center for Students with Disabilities, Title IX Office, Student Health and Wellness -- Mental Health

Husky Study Groups

Are you interested in forming a study group with other students in the class? There is a study group application in Nexus that can help you get started. Watch this video and click here for more information.
Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the Student Health and Wellness-Mental Health (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university’s student health insurance plan and also partially funded through university fees. If you do not have UConn’s student health insurance plan, most major insurance plans are also accepted. Students can visit the Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor, or contact the office at (860) 486-4705, or https://studenthealth.uconn.edu for services or questions.

Accommodations for Illness or Extended Absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify me as soon as possible. You do not need to disclose the nature of your illness, however, you will need to work with me to determine how you will complete coursework during your absence.

If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at dos@uconn.edu to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification.

COVID-19 Specific Information: People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. These symptoms may appear 2-14 days after exposure to the virus and can include:

- Fever,
- Cough,
- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

Additional information including what to do if you test positive or you are informed through contract tracing that you were in contact with someone who tested positive, and answers to other important questions can be found here: https://studenthealth.uconn.edu/updates-events/coronavirus/

(Student Created Videos) The videos created by students as part of this course are for sole use of the students enrolled in this course. Any other use of these videos or any pictures or derivatives of the videos without the written consent of the video creator is prohibited.

Student Responsibilities and Resources

Note to Faculty: please review the standard policy language posted on the Provost's webpage. https://provost.uconn.edu/faculty-and-staff-resources/syllabi-references/
As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources, which include:

- The Student Code
  - Academic Integrity
  - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Credit Hours and Workload
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

**Students with Disabilities**

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or [http://csd.uconn.edu/](http://csd.uconn.edu/).

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government.” (Retrieved March 24, 2013 from Blackboard’s website)

**Privacy Statement:** For information on managing your privacy at the University of Connecticut, visit the University’s Privacy page. NOTE: This course has NOT been designed for use with mobile devices.

**Help**

Technical and Academic Help provides a guide to technical and academic assistance.

This course uses the learning management platform, HuskyCT. If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the Help Center. You also have 24x7 Course Support including access to live chat, phone, and support documents.

**Student Technology Training**

Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at [https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline](https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline).

**Minimum Technical Skills**

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

**Evaluation of Course Experience**
Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes.

Additional informal formative surveys and other feedback instruments may be administered within the course.