

## MA/STA 320: Introductory Probability, Section 003

College of Arts & Sciences (A&S)

Department of Mathematics (MA)

Spring 2018

*Please read page 1 and 2 of this syllabus carefully. It contains essential information about the course organization, grading, tests, etc. See related links to webpages for additional information on selected topics. If you need more explanation ON AN ISSUE NOT COVERED HERE OR ON THE RELATED WEBPAGES, please do not hesitate to ask Dr. Nguyen.*

### Instructor Information:

*Instructor:* Nicholas D. Nguyen

*Office:* Patterson Office Tower 705 (POT 705)

*Email:* [nicholas.nguyen@uky.edu](mailto:nicholas.nguyen@uky.edu) (*The best method of contact!*)

*Office Hours:* MWF 10:30 AM - 11:45 AM, POT 705,

T, 9:00-10:00 AM, Mathskeller, White Hall 063,

Other times available by appointment.

**Class Time and Location:** MWF 1:00 PM - 1:50 PM, White Hall 205

**Course Web Page:** <http://www.ms.uky.edu/~ndng224/MA320/>

**Textbook:** <https://math.dartmouth.edu/~prob/prob/prob.pdf>

- We will cover chapters 1 through 9 of the textbook. This includes determination of probabilities, combinatorial analysis, conditional probability and independence, discrete and continuous random variables and their distributions, expectation and variance, the strong law of large numbers and the central limit theorem.

### Textbook Website:

[http://www.dartmouth.edu/~chance/teaching\\_aids/books\\_articles/probability\\_book/book.html](http://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.html)

- The textbook website has other materials, such as programs you can use to simulate experiments in probability. These programs are **not** required, but using them may help illustrate ideas and concepts in probability theory.

### Course Goals:

- Introduce students to probability and its applications outside of pure mathematics.
- Allow students to apply their knowledge of calculus to a more advanced topic.
- Offer students an opportunity to improve their writing in mathematics.

**Student Learning Outcomes:** Students should be able to understand and apply techniques from probability theory and its related topics (such as set theory and combinatorics) to problems in pure mathematics and in applications. Students should also demonstrate proficiency in expressing and sharing their thoughts and solutions in mathematics.

**Course Help:** If you find that you need help in the course, **then you should visit Dr. Nguyen AS SOON AS POSSIBLE!** If the posted office hours do not work with your schedule then you should ask about making an appointment.

## Course Outline

### **Chapter 1:** Discrete Probability Distributions

- Simulation of Discrete Probabilities.
- Discrete Probability Distributions.

### **Chapter 2:** Continuous Probability Densities

- Simulation of Continuous Probabilities.
- Continuous Density Functions.

### **Chapter 3:** Combinatorics

- Permutations.
- Combinations.

### **Chapter 4:** Conditional Probability

- Discrete Conditional Probability.
- Continuous Conditional Probability.
- Paradoxes.

### **Chapter 5:** Distributions and Densities

- Important Distributions.
- Important Densities.

### **Chapter 6:** Expected Value and Variance

- Expected Value.
- Variance of Discrete Random Variables.
- Continuous Random Variables.

### **Chapter 7:** Sums of Random Variables

- Sums of Discrete Random Variables.
- Sums of Continuous Random Variables.

### **Chapter 8:** Law of Large Numbers

- Discrete Random Variables.
- Continuous Random Variables.

### **Chapter 9:** Central Limit Theorem

- Bernoulli Trials.
- Discrete Independent Trials.
- Continuous Independent Trials.

**Grading:** You will be evaluated in the course in the areas below:

Weekly Quizzes	50 points
Weekly Homework	50 points
Two Midterms (100 points each)	200 points
Comprehensive Final Exam	150 points

Your overall letter grade will be based on your point total:

A	405-450
B	360-404
C	315-359
D	270-314
E	0-269

**Attendance:** Attendance in class is expected. A student will receive an additional 10 pts extra credit added to their final score at the end of the semester if the number of lectures for which the student is not present during the entire class period is no greater than three.

**Quizzes:** There will be a quiz each week (usually on Friday), except in the first week (Week 0), dead week, or in a week where there is an exam. Problem solutions on exams and quizzes will be graded according to the quality of the solution and not just the correctness of the answer.

**Homework:** This portion of your grade will be earned by completing individual online assignments outside of class. These assignments are available at

<http://webwork.as.uky.edu/webwork2/MA320-S18-Nguyen/>

Homework is usually assigned every week, and typically will be due three to five days after it is assigned. There will be a homework assignment whose due date is during Dead Week.

**Midterm exams:** We will have two midterm exams. Both exams will count towards your grade. Each exam will be cumulative, although for the second midterm, emphasis may be given to material covered after the first midterm.

**Final exam:** The final exam is cumulative, although it may emphasize material covered after the second midterm.

**Makeup quizzes and exams:** If you miss a quiz or exam due to an excused absence, please contact the instructor to schedule a time for a makeup quiz or exam. See the next page for details on excused absences.

**Note on Calculators:** Please see this page for a description of permitted calculators which may be used on exams and quizzes:

<http://www.act.org/content/act/en/products-and-services/the-act/taking-the-test/calculator-policy.html>

You may use any graphing calculator that is permitted.

## Rules and Regulations

**Excused Absences:** University Senate Rule 5.2.4.2 defines the following as acceptable reasons for excused absences:

1. serious illness;
2. illness or death of family member;
3. University-related trips;
4. major religious holidays;
5. other circumstances your instructor finds to be “reasonable cause for nonattendance”.

**Be prepared to supply documentation for any absence you want to be counted as excused. You must show me this documentation within one week after the absence.** Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day for adding a class. It is almost always possible to notify your instructor of an excused absence before class. Students who have excused absences due to University-related trips or major religious holidays must inform the instructor prior to the absence and must complete all work prior to the absence. Students who are ill must inform the instructor of their absence(s) as soon as they return to class and they must provide documentation to demonstrate that the absence(s) was excused. Students who have excused absences due to illness or the death of a family member will be allowed to make up any missed work in a timely manner. These arrangements must be made with the instructor on a case-by-case basis.

**Academic Integrity, Cheating, and Plagiarism:** You should feel free to study with friends, but any work you submit for a grade should be your own work. This applies to all exams, quizzes, and writing assignments, with the exception of any assignment that is specifically designated as a group assignment.

Academic dishonesty, in any form, will not be tolerated. This includes, but is not limited to, copying a classmate’s work, allowing a classmate to copy your work, modifying an exam after it has been handed back in an attempt to deceive the instructor into believing the assignment was graded incorrectly. A student found guilty of academic dishonesty will receive an automatic E on the assignment, and in some cases the offense may lead to an E for the course, academic probation, or even expulsion. See sections 6.3.1 and 6.3.2 at [www.uky.edu/StudentAffairs/Code/part2.html](http://www.uky.edu/StudentAffairs/Code/part2.html) for more information regarding academic integrity.

**Disability Accommodations:** If you have documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Suite 407, Multidisciplinary Science Building, 859-257-2754, email address [dtbeac1@uky.edu](mailto:dtbeac1@uky.edu)) for coordination of campus disability services available to students with disabilities.

**Suggestions:** Constructive suggestions for this course are welcome at any time. I welcome suggestions that will improve the course both this semester and in semesters to come. If you have any concerns, please bring them to my attention first. Further recourse is available through the office of the Department Ombud and the Department Chair. Both the Ombud and the Chair can be reached from the main office in POT 719.

**Classroom Behavior, Decorum, and Civility:** I expect that you will not only attend class, but that you will participate in class. I expect that you will be respectful of yourself and others.

Please **do not bring food items in the classroom**. Any drinks you bring into the classroom must come in a container with a lid or cap. Please **turn off your cell phones** when you enter class. Please do not work on other classes during class. Please do not surf the internet during class. Please do not read the newspaper during class, work on Sudoku, etc. during class. Please do not sleep during class. Please do not talk or whisper during lecture unless the instructor has given you the floor. In a classroom it is difficult for other students and the instructor to hear if there are several little conversations taking place at the same time.

The university, college and department has a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right—and the responsibility—to ensure that all academic discourse occurs in a context characterized by respect and civility. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors. Students who are not respectful, not civil, or disruptive in any way may be asked to leave the class, with all subsequent penalties applied to their grade.

**Non-Discrimination Statement and Title IX Information:** The University of Kentucky faculty are committed to supporting students and upholding the University's non-discrimination policy.

Discrimination is prohibited at UK. If you experience an incident of discrimination we encourage you to report it to Institutional Equity & Equal Opportunity (IEEO) Office, 13 Main Building, (859) 257-8927.

Acts of Sex- and Gender-Based Discrimination or Interpersonal Violence: If you experience an incident of sex- or gender-based discrimination or interpersonal violence, we encourage you to report it. While you may talk to a faculty member or TA/RA/GA, understand that as a "Responsible Employee" of the University these individuals **MUST** report any acts of violence (including verbal bullying and sexual harassment) to the University's Title IX Coordinator in the IEEO Office. If you would like to speak with someone who may be able to afford you confidentiality, the Violence Intervention and Prevention (VIP) program (Frazee Hall Lower Level; <http://www.uky.edu/StudentAffairs/VIPCenter/>), the Counseling Center (106 Frazee Hall, <http://www.uky.edu/StudentAffairs/Counseling/>), and the University Health Services (<http://ukhealthcare.uky.edu/uhs/student-health/>) are confidential resources on campus.

**Important Dates:**

The following is a list of exam dates for the Spring 2018 semester (**TENTATIVE!**):

Monday, February 12: Midterm Exam 1

Monday, April 2: Midterm Exam 2

**Wednesday, May 2, 1:00 PM - 3:00PM:** Final Exam

**Important Semester Dates:**

The following is a list of important dates for the Spring 2018 semester:

- Wednesday, January 10: First day of classes
- Monday, January 15: Martin Luther King Birthday – Academic Holiday
- Wednesday, January 17: Last day to add a class
- Wednesday, January 31: Last day to drop a class without receiving a grade
- Monday, March 5: Midterm of Spring 2018 semester
- Mon-Fri, March 12–16: Spring Vacation – Academic Holidays
- Friday, March 30: Last day to withdraw from a class
- Friday, April 27: Last day of classes