Introduction to Probability (Math 203)
Sabancı University, Summer 2022-2023

The syllabus may be subject to change and update.

Lecturer: Çağdem Çelik
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Office: FENS 1003
Office Hour: TBA

Lecture Hours:
  Mondays 08:40 - 11:30 (FENS L055)
  Wednesdays 08:40 - 11:30 (FENS L055)

Recitation Hours: Fridays 14:40 - 16:30

Teaching Assistants:
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Office Hours of TA’s: TBA

You are responsible for every announcement made in the lecture or in SUCourse+. Not attending the lecture or not following SUCourse+ regularly is not an excuse, in case you miss something.

Recitation Hours: Fridays 09:40 - 10:30


Prerequisite: Prerequisite is a grade at least D for MATH 102.

Tentative Course Outline:

- Chapter 1: Introduction and Combinatorial Methods
  - The Basic Principles of Counting
  - Permutations and Combinations
  - Multinomial Coefficients

- Chapter 2: Probability
  - Sample Space and Events
  - Postulates of Probability
  - Some Rules of Probability
  - Conditional Probability
  - Independent Events
  - Bayes’ Theorem

- Chapter 3,4,5: Discrete Random Variables
  - Discrete Random Variables (Ch. 3.1)
  - Discrete Probability Functions and Cumulative Distribution Functions (Ch. 3.2)
  - The Expected Value of a Discrete Random Variable (Ch. 4.1)
- Moments, Variance of a Discrete Random Variable (Ch. 4.3)
- Moment Generating Function a Discrete Random Variable (Ch. 4.5)
- Special (Discrete) Probability Distributions (Selected Sections)
  * The Uniform Distribution (Ch. 5.2)
  * The Bernoulli and Binomial Distributions (Ch. 5.3 and Ch. 5.4)
  * The Negative Binomial and Geometric Distributions (Ch. 5.5)
  * The Hypergeometric Distribution (Ch. 5.6)
  * The Poisson Distribution (Ch. 5.7)

- Chapter 3, 4, 5: Continuous Random Variables
  - Continuous Random Variables (Ch. 3.3)
  - Continuous Probability Densities and Cumulative Distribution Functions (Ch. 3.4)
  - The Expected Value of a Continuous Random Variable (Ch. 4.2)
  - Moments, Variance of a Continuous Random Variable (Ch. 4.3)
  - Moment Generating Function a Continuous Random Variable (Ch. 4.5)
  - Special Probability Densities (Selected Sections)
    * The Uniform Distribution (Ch. 6.2)
    * The Exponential Distribution (Ch. 6.3)
    * The Normal Distribution (Ch. 6.5)
    * The Normal Approximation to the Binomial Distribution (Ch. 6.6)

- Chapter 3, 4, 5, 6: Multivariate Random Variables
  - Multivariate Distributions (Ch. 3.5)
  - Marginal and Conditional Distribution Functions (Ch. 3.6 and Ch. 3.7)
  - Product Moments, Covariance (Ch. 4.6)
  - Moments of Linear Combinations of Random Variables (Ch. 4.7)
  - Conditional Expectation (Ch. 4.8)
  - Special Joint Probability Distributions (Selected Sections)
    * Multinomial Distribution (Ch. 5.8)
    * Multivariate Hypergeometric Distribution (Ch. 5.9)

- Chapter 7: Functions of Random Variables
  - Distribution Function Technique

- Chapter 8: Sampling Distributions
  - Samples, the Distribution of the Mean
  - The Central Limit Theorem

- Ch 8+: Basic Methods for Statistical Estimation and Testing (if time allows)

**Grading:**
Your grade exclusively depends on the below listed items. **There will be no other extra-credit opportunities.**

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<tbody>
<tr>
<td>Midterm Exam (on July 31, 2023 at 9:30)</td>
<td>45%</td>
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<tr>
<td>Final Exam</td>
<td>50%</td>
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<tr>
<td>Recitation Grade</td>
<td>5%</td>
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The passing grade will be determined after the last exam. Be aware that this passing grade may not match the overall average of the students.
Exams:
Exams will be given in person on campus. The midterm exam will be on July 31st on Monday. More
detailed will be announced on SUCourse+ in due time.

The final exam may be given on any day between August 26th - August 29th. The date and time of the
final exam is determined by Student Resources and the instructors cannot change it.

Exams are closed book. This means that during the exams, the use of books, notes, electronic devices
(including cell phones, smart watches, calculators, computers etc.), or any other kind of supporting
material is NOT allowed. A student violating this rule will receive 0 points for that exam.

Lecture Attendance:
There will be no lecture attendance but attending the classes is strongly suggested.

Recitation Grade:
You are expected to study the lecture notes before you enter the recitation so that you can actively
participate in the discussion, there will not be a review of the course material. In each recitation, a
certain number of pop-up questions will be presented to the students. Approximately there will be 7
quizzes and we will consider the highest 5. There will be no make-up for any of those pop-up
questions. Disturbing your classmates, being late, leaving early during classes will not be
tolerated and will affect your recitation grade.

Supplementary Exercises:
There will be supplementary exercises assigned each week via SuCourse+. You are not expected to return
the solutions but you are strongly advised to solve them (even if not in full detail) before the recitation.

Make Up Policy:
Make-ups are only allowed for the midterm exam and the final exam to those with an official report and
to those with an official permission notice from the university on the date of the exam in question. Stud-
ents must submit their reports/notice to the instructor before the exam in question. The ones having
other excuses should contact the instructor within the day of the exam to be missed and then it will
be decided whether these students are allowed to take the make-up exam. Any excuses to be brought
to the attention of the instructors after the exam will not be considered. No exceptions to these rules!
Make-ups for the midterm exam or the final will be at the end of the semester (during/after the finals
period.) Only students who got permission for the makeup will be informed about the exact time and
place. The make-up exam will contain all topics. If the student do not contact with the instructor
and do not take neither the exams nor the make-up, then (s)he gets NA.

Academic Honesty:
All university policies on academic integrity apply to our course, and they will be enforced. (more infor-

Any form of academic dishonesty (plagiarism, copying/using other people’s work, attending classes/exams
on behalf of other people, etc.) will be penalized with 0 points for the related exam/attendance and
disciplinary actions will be taken.

If we suspect any breach of academic integrity, we may ask for an oral validation of the exam. In
this case the student will be invited to an oral interview and will be given the opportunity to explain
their solution. If the student cannot provide sufficient explanations, or does not show up to the interview,
their exam grade will be replaced with zero (0).
Class Discipline:

It is our responsibility to provide students with excellent teaching and learning environments. We are therefore asking you to respect both our responsibility to teach and the right of other students to learn. Any action that disturbs your classmates or disrupts the online activities is unacceptable. Repeated violations of the above common sense rules may cause a student to be counted as absent for a lecture or a recitation.

Suggestions:

• Attend the lectures and recitations regularly. Make sure you attend in your own (registered) section.

• Feel free to ask me and your teaching assistants questions in and out of class, especially during office hours.

• In this course, definitions and Theorems build on each other quickly. If you fall behind, it will be difficult to catch up. Work hard from the beginning, and come to office hours immediately if you do not understand something.

• Studying out of class for this course should become a routine. Key to success in mathematics is practice. Solve many problems related to each concept.

• Students are expected to follow the announcements made during the lectures or in SUCourse. Not attending the class or not following SUCourse+ regularly is not an excuse, in case you miss something.

Registration Overrides:

Time conflict requests for lecture hours will not be accepted.