

Syllabus MATH 203, Introduction to Probability Fall 2020-2021

1 Instructors and Teaching Assistants

Instructors Section A and Section B
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2 Office hours

Office hours instructor:

Yunus Sarıkaya Tuesday 13:00-14:00 Zoom Meeting ID: 5179244142,

Office hours TA's:

Çiğdem Çelik Monday 13:40-14:30 Zoom Meeting ID: 8969661357,

Afrim Bojnik Tuesday 15:40-16:30 Zoom Meeting ID: 3117992412,

Burcu Barsakçı Tuesday 9:40-10:30 Zoom Meeting ID: 4205597389,

Nour Alnajjare Monday 14:40-15:30 Zoom Meeting ID: 3500014362,

Oğuz Kaan Köksal Zoom Meeting ID: ,

Farjad Zafar Monday 12:40-13:30 Zoom Meeting ID: 9079272882,

Hossein Mahdavi Monday 16:40-17:30 Zoom Meeting ID: 4888488960,

Jiyan Baran Bükün Tuesday 13:40-14:30 Zoom Meeting ID: 9233481906,

Emine Tuğba Yesin Monday 9:40-10:30 Zoom Meeting ID: 3577815591,

3 Time and Venue

1. Lectures will be online through Zoom and Zoom Meeting ID: 5179244142.

Section A Wednesday 8.40-9.30 Friday 8.40-10.30
Section B Wednesday 9.40-10.30 Friday 12.40-14.30.

2. Recitations will be recorded offline and uploaded to drive link with Lecture videos.

4 Textbook

John Freund's Mathematical Statistics with Applications, 8th Edition, Pearson-Prentice Hall, 2004, ISBN 978-1-292-02500-1. It can be obtained through the following link: <https://www.homerbooks.com/urun/john-e-freunds-mathematical-statistics-with-applications>

5 Prerequisite and Corequisite

Prerequisite is a grade at least D for MATH 102. MATH 203R is a corequisite.

6 Course Description

The course covers the material listed below. Chapters refer to the above mentioned textbook.

- Chapter 1: Introduction and Combinatorial Methods
 - The Basic Principles of Counting
 - Permutations
 - 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 3,4,6: 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)
 - Chebyshev’s Theorem (Ch. 4.4)
 - Moment Generating Function a Continuous Random Variable (Ch. 4.5)
 - Special Probability Densities (Selected Sections)
 - * The Uniform Distribution (Ch. 6.2)
 - * The Gamma and Exponential (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)
 - * Bivariate Normal Distribution (Ch. 6.7)
- Chapter 7: Functions of Random Variables
 - Distribution Function Technique

- Moment Generating Function Technique
- Chapter 8: Sampling Distributions
 - Samples, the Distribution of the Mean
 - The Law of Large Numbers, the Central Limit Theorem
 - Chi-square, t, and F Distributions
 - Order Statistics

7 Exam Policy and Dates

- There will be 1 midterm **during** the semester and a final **after** the semester. The exams will be given online and we will use zoom application to proctor the exams. The tentative dates are as follows:

Midterm (30%): 26 November (Thursday), 19:40-21:40

Final (40%): TBA (During Finals Weeks)

Homeworks (30%): 6 homeworks will be given

+ 5 %lecture attendance.

The dates & times will be announced once the dates are confirmed by the Student Resources.

The zoom rooms for proctoring will be announced before the exams.

- 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 learning material is **NOT** allowed. A student violating this rule will receive 0 points for that exam.

During exam, we will do online proctoring through Zoom. You will need to have working cameras, which will show your face and some part of your desk. If there is any technical issue during the exam coming from your side, you are allowed to take make-up exam. But taking make-up exam is not recommended

- Do not underestimate this course! It is advised that you study regularly and attend all lectures and recitation sessions. If you do not fully understand the material it is recommended to take an appointment with your TA or your instructor immediately after class.
- 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.
- It is students' responsibility to follow all the announcements made in class and those made via SUCourse.

8 Make-up Policy

- If a student misses an exam and wishes to make it up, she/he can take a make-up exam. Students who wish to take make-up exam do **NOT** need to submit a health report or her/his reasoning. You can have a make-up exam for **ONLY** one of the exams.
- Make-up for the midterm and the final exam will be held at the end of the final exam period and it will cover all the topics. Only students who miss an exam will be able to take it.
- Note that make-up exam will be harder than regular exams. Thus, we suggest that without a present of any dire situations (e.g., a serious health problem), a student should not take the make-up exam.

9 Course Policy

- **Lectures & SuCourse:** Following the lectures and SuCourse activity is a prerequisite for the course. The students are responsible from every announcement made during the lectures or on SuCourse.
- **Homeworks:** There will be homeworks assigned roughly every two weeks. It will usually consist of 2 problems, and you will have 1 week to finish and submit the given homework problems.
- **Exercises:** There will be exercises given every week starting from second week. They will not be graded. You are not expected to return solutions but you are strongly advised to solve them and discuss during the next office hours of TA.
- **Recitations:** Recitations will be offline, in which one of the TA's will solve some questions from exercises. Then, the videos will uploaded on google drive.
- **Attendance:** Attendance in the lectures will be regularly checked via Zoom Logs. Please use your Sabanci University accounts to connect Zoom, so that we will obtain your full name. Lecture Attendance will reflect in your grade as a 5% bonus grade.
- **Academic Honesty:** We expect all students to follow common-sense practices during the exams. Cheating will not be tolerated. The action against such violations could range from getting a zero on the particular exam to explaining the case in front of the Disciplinary Committee.
- **Registration Overrides:** Time conflict requests will be accepted. However, any and all negative outcomes that may result are solely the student's responsibility.