

# Syllabus MATH 203, Introduction to Probability

## Spring 2021-2022

### 1 Instructors and Teaching Assistants

Instructors	Section A	Section B
	Yunus Sarıkaya	Turgay Bayraktar
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Teaching assistants:		
	Melike Efe (coordinator TA)	melikeefe@sabanciuniv.edu
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	Çiğdem Çelik	cigdemcelik@sabanciuniv.edu
	Ece Naz Erülker	eceerulker@sabanciuniv.edu
	Harun Tolasa	harun.tolasa@sabanciuniv.edu
	Jalal Karimzadehkhoei	j.karimzadehkhoei@sabanciuniv.edu

### 2 Recitations

Recitations will be online and the links for each recitation are as follows:

Section A1 (Burcu Barsakçı)	—	Link: <a href="https://sabanciuniv.zoom.us/j/99987083571">https://sabanciuniv.zoom.us/j/99987083571</a>
Section B1-B2 (Burcu Barsakçı)	—	Link: <a href="https://sabanciuniv.zoom.us/j/99987083571">https://sabanciuniv.zoom.us/j/99987083571</a>
Section C1-C2 (Afrim Bojnik)	—	Link: <a href="https://sabanciuniv.zoom.us/j/3117992412">https://sabanciuniv.zoom.us/j/3117992412</a>
Section D1-D2 (Çiğdem Çelik)	—	Link: <a href="https://sabanciuniv.zoom.us/j/99038759652">https://sabanciuniv.zoom.us/j/99038759652</a>
Section E1-E2 (Melike Efe)	—	Link: <a href="https://sabanciuniv.zoom.us/j/93723590311">https://sabanciuniv.zoom.us/j/93723590311</a>
Section F1 (Harun Tolasa)	—	Link: <a href="https://sabanciuniv.zoom.us/j/2561106410">https://sabanciuniv.zoom.us/j/2561106410</a>
Section G1 (Ece Naz Erülker)	—	Link: <a href="https://sabanciuniv.zoom.us/j/9256045584">https://sabanciuniv.zoom.us/j/9256045584</a>
Section H1-H2 (Burcu Barsakçı)	—	Link: <a href="https://sabanciuniv.zoom.us/j/99987083571">https://sabanciuniv.zoom.us/j/99987083571</a>

### 3 Office hours

#### Office hours instructor:

Yunus Sarıkaya	By appointment	<a href="https://sabanciuniv.zoom.us/j/5179244142">https://sabanciuniv.zoom.us/j/5179244142</a>
Turgay Bayraktar	By appointment	<a href="https://sabanciuniv.zoom.us/j/99557934074">https://sabanciuniv.zoom.us/j/99557934074</a>

#### Office hours TA's:

Afrim Bojnik	Monday 14:40-15:30	<a href="https://sabanciuniv.zoom.us/j/3117992412">https://sabanciuniv.zoom.us/j/3117992412</a>
Burcu Barsakçı	Tuesday 13:40 - 14:30	<a href="https://sabanciuniv.zoom.us/j/99987083571">https://sabanciuniv.zoom.us/j/99987083571</a>
Çiğdem Çelik	Monday 13.40-14.30	<a href="https://sabanciuniv.zoom.us/j/99038759652">https://sabanciuniv.zoom.us/j/99038759652</a>
Ece Naz Erülker	Tuesday 9.40-10.30	<a href="https://sabanciuniv.zoom.us/j/9256045584">https://sabanciuniv.zoom.us/j/9256045584</a>
Harun Tolasa	Wednesday 14.40-15.30	<a href="https://sabanciuniv.zoom.us/j/2561106410">https://sabanciuniv.zoom.us/j/2561106410</a>
Melike Efe	Monday 14:40-15:30	<a href="https://sabanciuniv.zoom.us/j/98571878742">https://sabanciuniv.zoom.us/j/98571878742</a>

### 4 Lecture Time and Venue

1. Lectures will be in-class and simultaneously live-streamed via Zoom. For those of you who wish to follow online, the Zoom links will be posted on SUCourse+. In order to have access to them, you must be logged in to Zoom with your Sabanci account. The lecture recordings will be made available afterwards, so that you can also watch them at a later time. They are going to be posted on SUCourse+.

Section A	Wednesday 8.40-9.30	Friday 8.40-10.30	FENS G077 -Meeting ID: 989 2729 0363
Section B	Wednesday 9.40-10.30	Friday 12.40-14.30	FENS G077- Meeting ID: 995 5793 4074

Section A - Lecture Zoom Link: <https://sabanciuniv.zoom.us/j/98927290363>

Section B - Lecture Zoom Link: <https://sabanciuniv.zoom.us/j/99557934074>

### 5 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>

### 6 Prerequisite and Corequisite

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

### 7 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

## 8 Exam Policy and Dates

- There will be 2 midterms **during** the semester and a final exam **after** the semester. The tentative dates are as follows:  
 Midterms (30% each): MT1 Saturday, April 2nd between 10.00-11.30am  
 MT2 Saturday, May 21st between 10.00-11.30am Final (40%): TBA (During Finals Weeks)  
 Attendance Quiz (5% Bonus): 8-10 attendance quiz will be given and the best 6-8 will be taken.
- **Midterm:** All the exams will be given in-person on campus unless otherwise determined by the faculty board. The dates will be announced later. More details will be announced on SU-Course+ in due time.  
**Final Exam:** The final exam will be given in-person, on campus, during the finals week. The date and time of the final exam is determined by Student Resources and the instructors cannot change it. More details will be announced on SUCourse+ in due time.

- 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.

## 9 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.

## 10 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.
- **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 recitations.
- **Recitations:** Recitations will be online, in which one of the TA's will solve some questions from exercises.
- **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.