

This syllabus is subject to change due to unforeseen circumstances

MATH 203 – Introduction to Probability Fall 2024 Syllabus

1 Instructors and Teaching Assistants

Instructors:	Section A Turgay Bayraktar	Section B Gökalp Alpan
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Teaching Assistants:

name	last name	E-mail
Annissa Rachel	Vanwieren	annissa.vanwieren@sabanciuniv.edu
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Eren	Açar	erenacar@sabanciuniv.edu
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Bartu	Orhun	bartu.orhun@sabanciuniv.edu
Eren	Bektaş	erenbektas@sabanciuniv.edu
Mohammad	Zadeh Dabbagh	mohammad.dabbagh1@sabanciuniv.edu

2 Recitations

Recitations will be physical in-class, the schedule is as follows.

Day	Time	Section	Place	TA/LA
Tue	12:40 PM - 01:30 PM	A1	FASS 1079	Burcu Barsakçı
Tue	12:40 PM - 01:30 PM	A2	FMAN G065	Kadirhan Kana
Mon	09:40 AM - 10:30 AM	B1	FASS 1080	Sina Jorjani Totonchian
Mon	09:40 AM - 10:30 AM	B2	FMAN G045	Eren Bektaş
Mon	01:40 PM - 02:30 PM	C1	FASS 1080	Bartu Orhun
Mon	01:40 PM - 02:30 PM	C2	FENS L048	Eren Açar
Mon	01:40 PM - 02:30 PM	C3	FENS L047	Sina Jorjani Totonchian
Mon	04:40 PM - 05:30 PM	D1	FMAN G045	Annissa Rachel Vanwieren
Mon	11:40 AM - 12:30 PM	E1	FENS L067	Bartu Orhun
Mon	11:40 AM - 12:30 PM	E2	FENS L058	Eren Açar
Mon	03:40 PM - 04:30 PM	F1	FASS 1080	Annissa Rachel Vanwieren
Tue	10:40 AM - 11:30 AM	G1	FASS 1080	Kadirhan Kana
Tue	10:40 AM - 11:30 AM	G2	FENS L065	Mohammad Zadeh Dabbagh
Tue	02:40 PM - 03:30 PM	H1	FASS 1080	Burcu Barsakçı
Tue	02:40 PM - 03:30 PM	H2	FENS L065	Eren Bektaş

3 Office hours

Instructors:

Turgay Bayraktar W 10:40 – 11:30, and by appointment.
Gökalp Alpan W 14:40 – 15:30, and by appointment.

TAs:

name	last name	day	hour	place
Annissa Rachel	Vanwieren	Tue	14.40-15.30	FENS L068
Burcu	Barsakçı	Tue	11.00-11.50	FENS L068
Eren	Açar	Mon	10.40-11.30	FENS L1100
Kadirhan	Kana	Tue	14.40-15.30	FENS L068
Sina Jorjani	Totonchian	Mon	17.40-18.30	FENS 2017
Bartu	Orhun	Fri	11.40-12.30	FENS L068
Eren	Bektaş	Tue	9.30-10.30	FENS L068
Mohammad	Zadeh Dabbagh	Tue	11.40-12.30	FENS L032

4 Lecture Time and Venue

All lectures are physical and in class. They will not be broadcasted or recorded.
Lecture notes will be posted on SUCourse after each class.

Section A Wednesday 08:40-09:30 Friday 08:40-10:30 FMAN G071

Section B Wednesday 09:40-10:30 Friday 12:40-14:30 FMAN G071

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 having passed MATH 102 with at least D. 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
- Chapters 3, 4, 5: Discrete Random Variables
 - Discrete random variables (§ 3.1)
 - Discrete Probability Functions and Cumulative Distribution Functions (§ 3.2)
 - The Expected Value of a Discrete Random Variable (§ 4.1)
 - Moments, Variance of a Discrete Random Variable (§ 4.3)
 - Moment Generating Function a Discrete Random Variable (§ 4.5)
 - Special (Discrete) Probability Distributions (Selected Sections)
 - * The Uniform Distribution (§ 5.2)
 - * The Bernoulli and Binomial Distributions (§§ 5.3 – 5.4)
 - * The Negative Binomial and Geometric Distributions (§ 5.5)
 - * The Hypergeometric Distribution (§ 5.6)
 - * The Poisson Distribution (§ 5.7)
- Chapters 3,4,6: Continuous Random Variables
 - Continuous Random Variables (§ 3.3)
 - Continuous Probability Densities and Cumulative Distribution Functions (§ 3.4)
 - The Expected Value of a Continuous Random Variable (§ 4.2)
 - Moments, Variance of a Continuous Random Variable (§ 4.3)
 - Chebyshev's Inequality (§ 4.4)
 - Moment Generating Function a Continuous Random Variable (§ 4.5)
 - Special Probability Densities (Selected Sections)

- * The Uniform Distribution (§ 6.2)
- * The Exponential Distribution (§ 6.3)
- * The Normal Distribution (§ 6.5)
- * The Normal Approximation to the Binomial Distribution (§ 6.6)
- Chapters 3,4,5,6: Multivariate Random Variables
 - Multivariate Distributions (§ 3.5)
 - Marginal and Conditional Distribution Functions (§§ 3.6 – 3.7)
 - Product Moments, Covariance (§ 4.6)
 - Moments of Linear Combinations of Random Variables (§ 4.7)
 - Conditional Expectation (§ 4.8)
 - Special Joint Probability Distributions (Selected Sections)
 - * Multinomial Distribution (§ 5.8)
 - * Multivariate Hypergeometric Distribution (§ 5.9)
 - * Bivariate Normal Distribution (§ 6.7)
- Chapter 7: Functions of Random Variables
 - Distribution Function Technique
- Chapter 8: Sampling Distributions
 - Samples, the Distribution of the Mean
- Chapter 8+: Basic Methods for Statistical Estimation and Testing
 - Point estimation
 - Confidence interval
 - Hypothesis testing

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: November 2nd, Saturday between 17.00-18.30

MT2: December 14th, Saturday between 14.30-16.00

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

Attendance Quiz (5% Bonus): 8-10 attendance quiz will be given in recitation hours and the best 6-8 will be taken.

- **Midterm:** All the exams will be given in-person on campus unless otherwise determined by the administration. The dates and locations will be announced later. More details will be announced on SUCourse 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 final exam. Be advised that this passing grade may not match the overall average of the students.
- It is the students' responsibility to follow all the announcements made in class and those made via SUCourse.

9 Make-up Policy

- If you miss only one exam and wish to make it up, you can take a make-up exam. Students who wish to take one make-up exam do **NOT** need to submit a health report or her/his reasoning. If you miss more than one exams then you have to provide documentation (eg. Doctor's note etc.) and explain the reasoning.
- Make-up for the either midterms 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.

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 of the semester. 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 physical and in-class. Their schedule and locations will be posted on the course website. During recitations your TA will solve some questions from the exercises posted in advance.
- **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.