Syllabus MATH 203, Introduction to Probability
Fall 2021-2022

1 Instructors and Teaching Assistants

Instructors	Section A	Section B
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Mert Berke Şahin	mert.sahin@sabanciuniv.edu
Moses Chuka Ebere	moses.ebere@sabanciuniv.edu

2 Recitations

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

Section A1-A2 (Burcu Barsakçı)	—	Link: https://sabanciuniv.zoom.us/j/92960964129
Section A3-A4 (Afrim Bojnik)	—	Link: https://sabanciuniv.zoom.us/j/3117992412
Section A5-A6 (Oğuz Kaan Köksal)	—	Link: https://sabanciuniv.zoom.us/j/7571285934
Section A7-A8 (Burcu Barsakçı)	—	Link: https://sabanciuniv.zoom.us/j/91919331011
Section A9-A10 (Melike Efe)	—	Link: https://sabanciuniv.zoom.us/j/98140390672
Section B1-B2 (Burcu Barsakçı)	—	Link: https://sabanciuniv.zoom.us/j/97320343369
Section B3-B4 (Mert Berke Şahin)	—	Link: https://sabanciuniv.zoom.us/j/3900383404
Section B5-B6 (Moses Chuka Ebere)	—	https://sabanciuniv.zoom.us/j/98426718125
Section B7-B8 (Burcu Barsakçı)	—	Link: https://sabanciuniv.zoom.us/j/94653847316
Section B9-B10 (Melike Efe)	—	Link: https://sabanciuniv.zoom.us/j/93149081057

3   Office hours

Office hours instructor:

Yunus Sarıkaya	By appointment	https://sabanciuniv.zoom.us/j/5179244142

Office hours TA's:

Melike Efe	Tuesday 12:40-13:30	https://sabanciuniv.zoom.us/j/94958285069
Afrim Bojnik	Monday 14:40-15:30	https://sabanciuniv.zoom.us/j/3117992412
Burcu Barsakçı	Tuesday 15:40 - 16:30	https://sabanciuniv.zoom.us/j/96381825904
Mert Berke Şahin	Monday 15:40-16:30	https://sabanciuniv.zoom.us/j/3900383404
Oğuz Kaan Köksal	Tuesday 11:40 - 12:30	https://sabanciuniv.zoom.us/j/7571285934
Ahmed Abdullah	Wednesday 16:40-17:30	https://zoom.us/j/4731686349
Moses Chuka Ebere	Thursday 14:40-15:30	https://sabanciuniv.zoom.us/j/96022976638
Alper Gün	TBA	TBA
Harun Tolasa	TBA	TBA

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	PAC(SGM) -Meeting ID: 91098536739
Section B	Wednesday 9.40-10.30	Friday 12.40-14.30	PAC(SGM)- Meeting ID: 95775631433

   Section A - Lecture Zoom Link: https://sabanciuniv.zoom.us/j/91098536739

   Section B - Lecture Zoom Link: https://sabanciuniv.zoom.us/j/95775631433

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 Bernouilli 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 1 midterm **during** the semester and a final **after** the semester. The tentative dates are as follows:

  Midterm (40%): 14 November, 17:00-19:00
  Final (50%): TBA (During Finals Weeks)
  Homeworks (10%): 4-5 homeworks will be given and best 3-4 will be taken.

- **Midterm**: The midterm exam will be given in-person, on campus. The date 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 period. The date and time of the nal 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.

- **Homeworks**: There will be homeworks assigned roughly every two-three 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 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.