

# YILDIZ TECHNICAL UNIVERSITY

## Department of Economics

IKT5220 Mathematical Statistics for Economists  
2020 - 2021 Fall

**Instructor:** Dr. Tolga Aksoy  
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**Class Hours:** Friday, 14:00 - 16:50

### **Objectives:**

This is a masters level course in statistics for economists. The objective of this course is to give an introduction to probability theory and mathematical statistics. The course intends to provide the basic statistical tools that will be used in later econometrics courses.

### **Learning Outcomes:**

After successfully completing this course:

1. Students will learn mathematical foundations of statistics.
2. Students will learn probability distributions and probability densities in detail.
3. Students will be able to use and evaluate point and interval estimation techniques.

### **Prerequisites:**

Knowledge of advanced calculus is a prerequisite.

### **Mode of Instruction:**

Note-taking by writing, rather than by typing or taking photos of the white board improves conceptual learning significantly. Additionally, with cellphones, some students distract others by viewing non-course material during class. **Therefore, use of cellphones is prohibited during lectures.** Put your cellphone away and have it either off or set to airplane mode (even simply vibrating is a distraction to you). You will be asked to leave the room if you are found using either in class.

### **Grading Policy:**

Grading of the course will be based on five homeworks (20%) two midterm exams (40%) and one final exam (40%). All exams will be closed-books, closed-notes. There will be no make-up exams except for documented medical reasons.

$\geq 85$	AA	40 - 48	DC
76 - 84	BA	30 - 39	DD
67 - 75	BB	20 - 29	FD
58 - 66	CB	$\leq 19$	FF
49 - 57	CC		

***Readings:***

The textbook of the course is:

[**M&M**] Irvin Miller and Marylees Miller. *John E. Freund's Mathematical Statistics with Applications*. Pearson. 8<sup>th</sup> Edition. 2005.

Other relevant readings are:

[**DGS**] Morris H. DeGroot and Mark J. Schervish. *Probability and Statistics*. Pearson. 4<sup>th</sup> Edition. 2011.

[**HMC**] Robert V. Hogg, Joseph W. McKean, Allen T. Craig. *Introduction to Mathematical Statistics*. Pearson. 8<sup>th</sup> Edition. 2018.

[**P**] Micheal Panik. *Advanced Statistics from an Elementary Point of View*. Academic Press. 2005.

***Tentative Course Outline:***

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

<b>Week</b>	<b>Content</b>
Week 1	<ul style="list-style-type: none"><li>• Introduction</li></ul>
Week 2	<ul style="list-style-type: none"><li>• Probability</li><li>• Reading assignment: <b>(M&amp;M, Ch.2)</b></li></ul>
Week 3	<ul style="list-style-type: none"><li>• Probability Distributions and Probability Densities</li><li>• Reading assignment: <b>(M&amp;M, Ch.3)</b></li></ul>
Week 4	<ul style="list-style-type: none"><li>• Probability Distributions and Probability Densities (<i>cont.</i>)</li><li>• Reading assignment: <b>(M&amp;M, Ch.3)</b></li></ul>
Week 5	<ul style="list-style-type: none"><li>• Mathematical Expectation</li><li>• Reading assignment: <b>(M&amp;M, Ch.4)</b></li></ul>
Week 6	<ul style="list-style-type: none"><li>• Mathematical Expectation (<i>cont.</i>)</li><li>• Reading assignment: <b>(M&amp;M, Ch.4)</b></li></ul>
Week 7	<ul style="list-style-type: none"><li>• Special Probability Distributions</li><li>• Reading assignment: <b>(M&amp;M, Ch.5)</b></li></ul>
Week 8	<ul style="list-style-type: none"><li>• Special Probability Distributions (<i>cont.</i>)</li><li>• Reading assignment: <b>(M&amp;M, Ch.5)</b></li></ul>
Week 9	<ul style="list-style-type: none"><li>• Special Probability Densities</li><li>• Reading assignment: <b>(M&amp;M, Ch.6)</b></li></ul>
Week 10	<ul style="list-style-type: none"><li>• Special Probability Densities</li><li>• Reading assignment: <b>(M&amp;M, Ch.6)</b></li></ul>
Week 11	<ul style="list-style-type: none"><li>• Sampling Distributions</li><li>• Reading assignment: <b>(M&amp;M, Ch.8)</b></li></ul>
Week 12	<ul style="list-style-type: none"><li>• Point Estimation</li><li>• Reading assignment: <b>(M&amp;M, Ch.9)</b></li></ul>