

Middle East Technical University
Department of Economics
Spring 2025-2026
ECON 206
ERDİL, AŞIK

COURSE SCHEDULE

Section 01: Monday 09:40-12:30 FZ14

Section 02: Monday 09:40-12:30 FZ16

COURSE OUTLINE

1. Sampling Distributions and the Central Limit Theorem.

- 1.1 Sampling Distributions
- 1.2 The Central Limit Theorem
- 1.3 Order Statistics

2. Estimation.

- 2.1 The Bias and Mean Square Error of Point Estimators
- 2.2 Some Common Unbiased Point Estimators
- 2.3 Evaluating the Goodness of Point Estimator

3. Properties of Point Estimators and Methods of Estimation.

- 3.1 Unbiasedness
- 3.2 Relative Efficiency
- 3.3 Consistency
- 3.4 Sufficiency
- 3.5 Cramer-Rao Inequality
- 3.6 The Rao-Blackwell Theorem and Minimum-Variance Unbiased Estimation
- 3.7 The Method of Moments
- 3.8 The Method of Maximum Likelihood

4. Interval Estimation

- 4.1 Confidence Intervals for Mean
- 4.2 Confidence Intervals for Variance

5. Hypothesis Testing.

- 5.1 Elements of a Statistical Test
- 5.2 Common Large-Sample Tests
- 5.3 Calculating Type I&II Errors
- 5.4 Relationships between Hypothesis Testing Procedures and Confidence Intervals
- 5.5 Testing Hypotheses Concerning Mean(s)
- 5.6 Testing Hypotheses Concerning Variance(s)
- 5.7 Power of the test

6. Regression and Ordinary Least Squares

- 6.1 Simple Linear Regression and its basic assumptions
- 6.2 Estimation
- 6.3 Estimation and Curve Fitting
- 6.4 Goodness of Fit
- 6.5 Finite Sample Properties of Estimators
- 6.6 Asymptotic Properties of Estimators
- 6.7 Estimating Variance
- 6.8 Test of Hypothesis
- 6.9 Prediction
- 6.10 Specification
- 6.11 Model without Intercept term
- 6.12 Problem of Functional Form

COURSE MATERIAL:

1. Devore, J.L. and Berk, K.N. (2012) Modern Mathematical Statistics with Applications, 2nd Editin, New York: Springer.
2. Hogg, R.V., Tanis, E.A. and Zimmerman, D.L., (2015) Probability and Statistical Inference, 9th Global Edition, London: Pearson.
3. Akdi, Y., (2014) Matematiksel İstatistik Giriş, Ankara: Gazi Kitabevi.
4. Wackerly, D.D., Mendenhall, W. And Scheaffer, R.L., (2008) Mathematical Statistics With Applications, 7th Edition, Pacific Grove:Duxbury.
5. Biswal, P.C., (2007), Probability and Statistics, Prentice-Hall of India
6. Bain, L.J. And Engelhardt, M., (1992) Introduction to Probability and Mathematical Statistics, 2nd Edition, Belmont: Duxbury.
7. Hogg, R.V., Mckean, J.W., and Craig, A.T., (2006) Introduction to Mathematical Statistics, 6th Edition, New Jersey: Prentice Hall.
8. Newbold, P., Carlson, W.L., and Thorne, B., (2003) Statistics for Business and Economics, New Jersey: Prentice Hall.
9. Kvanli, A.H., Pavur, R.J. and Guynes C.S (2000) Introduction to Business Statistics, 6th Edition, South Western College Publishing, UK.
10. Vickers; A., (2010) What is a P-value Anyway?, Boston: Addison-Wesley.
11. Maddala, G.S., Introduction to Econometrics, Third Ed.
12. Thomas, R.L., Modern Econometrics
13. Gujarati, D., Basic Econometrics
14. Ramanathan, R., Introductory Econometrics

COURSE ASSESSMENT: THIS COURSE WILL BE ASSESSED BY A MID-TERM EXAM, A FINAL EXAM, ASSIGNMENTS AND POP-UP QUIZZES.

THE MID-TERM EXAM WILL BE HELD ON APRIL 8, 2026. THOSE WHO DO NOT ATTEND CLASSES AND EXAMS WITHOUT A VALID AND LEGAL EXCUSE WILL BE GRADED WITH NA.

THE WEIGHTS FOR THE EXAMS ARE 40% MID-TERM, 50% FINAL EXAM, 10% ASSIGNMENTS AND QUIZZES.

These weights apply to students who score above an acceptable threshold on the final exam. Depending on the difficulty and mean score of the final exam, the instructors reserve the right to fail students whose final exam performance demonstrates insufficient proof of learning, even if they achieved high grades on the midterm.

The solutions for pop-up quizzes will be provided at the end of classes but the solutions will not be posted online. It is the students' responsibility to attend the classes and participate in pop-up quizzes. Instructors also reserve the right to hold in-class assignments in lieu of take-home assignments. The dates for in-class assignments will be announced during the term.

Cheating: All university, faculty, and department principles on academic honesty will be strictly enforced. The usual consequence for academic dishonesty is failure in the course and additional disciplinary action. Examinations are individual and are to be completed without unauthorized outside assistance. Persons observed cheating during examinations will automatically receive a failing grade in the course. Homework assignments are individual, unless otherwise specified by the instructor, and are to be completed without unauthorized outside assistance as well. Persons observed cheating in their homework assignments will receive a score of zero for the portion of the semester grade that is allocated to such assignments. In addition to the consequences above, the instructor will initiate disciplinary action against the student(s) involved in academic dishonesty.

Plagiarism: The instructor assumes that students will do their own work. By placing their names (individual or team) on assignments, students are affirming that the contents are their original work. Ideas should be stated in the student's own wording. Violation of this provision will be considered as unethical behavior, subject to disciplinary action. If you have any doubt about the use of a specific material, see the instructor ahead of time.

Examination Rules: Students must present a valid METU Student ID during the exam. Cellular phones must be turned off and stowed away during the examinations. Students whose phones are observed to be turned on and/or not stowed away will receive a score of zero for the examination. Additional exam rules will be announced before the exams. Under no circumstances will a make-up exam be administered if a student misses a midterm or final. If a student misses a midterm exam due to an unanticipated and serious medical emergency or due to a death in the immediate family proven with the necessary documents, then that student will be required to take a makeup final exam administered by the Department at the officially announced day and time. Medical documents should be approved by METU Medical Center within five days and presented to the instructor. There will be no make-ups for quizzes. **STUDENTS WILL NOT BE ALLOWED TO LEAVE THE EXAM FOR ANY REASON.**

Student with Disabilities: Any student, who, because of a disabling condition, may require special arrangements in order to meet course requirements, should contact the instructor as soon as possible. Students should present the appropriate documentation from the university's Disability Support Office (Engelsiz ODTÜ Birimi, ODTÜ Kütüphanesi, Solmaz İzdemir Salonu, Tel: 2107196; engelsiz@metu.edu.tr) verifying their disability, and outlining the special arrangements required. Please note that no accommodations will be provided to the disabled students prior to the completion of this approved University process.

Know your rights and responsibilities!

<http://oidb.metu.edu.tr/en/middle-east-technical-university-rules-and-regulations-governing-undergraduate-studies-the-turkish-version>

Responsible use of AI: *To carefully review syllabi of all their courses about use of GenAI: Students must never use GenAI if it is not explicitly allowed in the syllabi by the professor.*

To consult with their professors (thesis advisor and/or course instructor) about using GenAI: If a student is in doubt about use of GenAI in a specific course or other academic work, they must communicate with the corresponding faculty member. Their expertise and guidance will help students navigate through the ethical considerations and make informed decisions regarding integrating GenAI into their academic work. If they are still unsure about whether to use GenAI or not in a particular situation after reviewing the syllabus and consulting with their professor, they should not use to be on the safe side.

To cite other peoples' ideas and acknowledge the use of AI tools & be transparent about the use of AI tools: If students use content generated by AI tools in their work, they must provide appropriate attribution to the AI system and any human contributors. They should not submit assignments which include AI-generated content without giving proper attribution to avoid academic misconduct. They should learn how to cite the content generated by AI tools correctly.

To keep records of how and why AI tools were used: Maintaining comprehensive records of the usage methods and rationales behind GenAI tools will contribute to transparency and accountability in students' academic life.

To consult additional sources to verify factual accuracy: When using AI-generated information, it is crucial to critically assess its accuracy and credibility.

To approach GenAI tools critically: Students should regard GenAI tools as supportive aids to enhance their learning while still upholding their creative and critical thinking skills.

To avoid sharing personal, confidential, or sensitive information: Students must exercise caution while providing AI tools with personal data, ensuring appropriate consent whenever necessary.

To understand the biases and limitations of GenAI: Before integrating GenAI into assignments, it is important to thoroughly comprehend its biases and limitations.

To keep up to date about using GenAI: It is crucial to stay current with the advancements in AI ethics, and responsible AI use to make informed decisions about AI integration in academic work. Participate in discussions and workshops on AI ethics organized by the university for a better understanding of responsible AI use in higher education.

Sources: <https://pdo.metu.edu.tr/en/announcements/GAI-guideline> and <https://tubitak.gov.tr/en/institutional/about-us/generative-artificial-intelligence-guideline> and <https://w3.bilkent.edu.tr/bilkent/generative-artificial-intelligence-genai-guideline/>