**ISTANBUL TECHNICAL UNIVERSITY**

**Department of Economics**

**ECN 205E Statistics I**

Fall 2019

**Syllabus**

**Instructor:** Serdar Altay

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**Office Hours:** Monday 13:30-15:00

**Lectures:** Wednesday, 9:30-12:30, ITU MEDB 101

**Practice Sessions: TBD**

## Course description

Economics has become an increasingly quantitative and applied discipline, whose scope is broader than ever among social (and other) sciences. The availability of data contributed to this evolution, making economists able to use statistical methods to study causality for a large range of (broadly defined) economic phenomena. However, rigorously measuring causal relationships based on observational data (as opposed to data produced through laboratory experiments) is *not* straightforward. This class, along with Statistics II, introduces students to the concepts and the tools used to analyze data and assess causal relationships. The important topics covered in Statistics I include graphical and numerical measures to describe data, probability methods, discrete and continuous probability distributions, confidence interval estimation, hypothesis tests and two variable regression analysis.

A practice session is provided to help student apply their knowledge and master the material seen in the lectures.

## Main objectives

By the end of the semester, the students will have:

* **Learned and applied concepts** related to statistics, probability theory and data analysis.
* **Improved** understanding of basic statistical models, and usage of statistical tools in solving management and economic problems
* **Built up a basis** for the further study of statistics and econometrics
* **Developed their analytical and critical thinking** skills in order to assess methods and results, as well as derive original insights from the data.

## Evaluation

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| --- | --- | --- |
| Activity | Quantity | Effect on grading (%) |
| Mid-term examination | 1 | 30% |
| Final examination | 1 | 36% |
| In-class quizzes and/or problem sets | 3 | 24% |
| Attendance |  | 10% |

In-class activities: 2 quizzes will take place during the semester (see class outline below) to help students prepare for the mid-term and final examinations. *In addition*, 1 problem set will be given. The professor may conduct additional random and unannounced quizzes– especially if attendance drops and/or students’ learning outcomes becomes problematic.

Mid-term examination: a mid-term evaluation will be organized by the professor. It will consist of questions of problem-solving and data analysis, but will also check students’ theoretical knowledge. The accuracy and quality of the analyses will be the main evaluation criteria. The mid-term includes all the material previously covered in class. [Tentative time: week 8; duration: 2 hours]

Final examination: the final examination is organized by the university at the end of the semester. As for the mid-term, it will consist in answering several questions in a structured, analytical manner, and to solve problems. The final is cumulative: it will include all the material covered during the class. [Time to be announced by the university; duration: 2 hours]

All evaluations require some level of mastery of the English language. Consequently, students are encouraged to:

* Learn pro-actively in class by asking definitions and precisions to the professor.
* Take any opportunity to study on their own to improve their English through the semester.

## Expectations from the students

* Take notes during the class: powerpoints may also be posted on Ninova after each lecture, but they are obviously not sufficient. Indeed, important information is provided during lectures and the discussions are integrally part of the class content.
* Purchase and use the textbook. Active reading will be helpful to master the class’ material.
* Try to attend all classes: attendance is critical in order to learn the material of the class and acquire the expected skills.
* Please refrain from using cellphones, tablets and computers. Again, this is disturbing yourself, your fellow students and the instructor.
* Be engaged and active in class: participation is formally graded, and constitutes the best way to learn, understand, and analyze the material. Attentive, careful participation is also critical to develop communication and analytical skills. Besides, it makes classes more enjoyable for everyone.

## Important information

Practice sessions: a teaching assistant has been assigned to the class to lead practice sessions. **Practice sessions are mandatory**. This session is an opportunity for you to ask outstanding questions as well as practice and apply what you have learned. It is the best way to prepare the quizzes and examinations.

Textbook (mandatory): *Statistics for Business and Economics* (8th Edition) by Paul Newbold, William Carlson, and Betty Thorne

Additional reference (optional): *Business Statistics in Practice* (7th Edition) by Bruce Bowerman, Richard O'Connell, and Emilly Murphree

Course website: Ninova website. Official communications will be made through Ninova:

please check that your registered email address is accurate; otherwise, you will miss important instructions.

***Course outline***

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| --- | --- | --- | --- |
| **Week** | **Class topic** | **Chapter in**  **NTC** | **To do / Note** |
| **1** | Syllabus, review |  |  |
| **2** | Using Graphical Measures to Describe Data I | *1* |  |
| **3** | Using Numerical Measures to Describe Data II | *2* |  |
| **4** | Excel application |  |  |
| **5** | Elements of Chance: Probability Methods I | *3* |  |
| **6** | Elements of Chance: Probability Methods II | *3* | QUIZ #1 |
| **7** | Discrete Probability Distributions | *4* |  |
| **8** | MIDTERM EXAMINATION |  |  |
| **9** | Continuous Probability Distributions II | *5* |  |
| **10** | Distributions of Sample Statistics | *6* |  |
| **11** | Confidence Interval Estimation I | *7* |  |
| **12** | Confidence Interval Estimation II | *8* |  |
| **13** | Hypothesis Tests of a Single Population and Two Populations | *9-10* | QUIZ #2 |
| **14** | Two Variable Regression Analysis | *11* |  |
| **Exam week** | FINAL EXAMINATION |  |  |

NB: November 5-9 week is the Fall Break and there will not be a class