OM060: AP Statistics

Course Description
The course introduces students to the basic concepts and methods in statistics, which is an essential tool in various areas of study in science and humanities. Students will develop their skill for the following broad statistical themes:

- **Exploring Data**: Presenting data and detecting patterns
- **Sampling and Experimentation**: Designing a study and collecting data
- **Anticipating Patterns**: Probabilistic modeling and simulation
- **Statistical Inference**: Estimation and hypothesis testing

The material taught in the course is equivalent to a one-semester, introductory non-calculus-based, college course in statistics. Students from a wide variety of backgrounds are encouraged to take the course.

The course covers topics including: experimental design, graphical data presentation, correlation, regression, data transformation, probability, probability distribution, confidence interval, statistical testing, etc.

Learning Objectives
Through the successful completion of this course, students will:

- learn basic statistical concepts and methods with their theoretical motivation,
- acquire skills to apply suitable statistical techniques to collect, organize, and analyze data in order to draw meaningful conclusions,
- be familiar with technology useful to deal with statistical problems,
- hone skills to efficiently communicate statistical ideas in written and oral presentations, and
- be well-prepared for the AP Statistics exam.

Required Textbook
*Introduction to Statistics and Data Analysis* (with Statistics CourseMate)
Peck, Olsen and Devore

Recommended Textbook
*Barron’s AP Statistics*
M. Sternstein

Calculator Requirement
TI-84 Plus Silver Edition Graphing Calculator

We will use graphing calculators in the course. Students are required to have a TI-84 graphing calculator or a graphing calculator that covers the essential functions of those calculators sufficient for the purpose of the course.
Overview of Assignments

- **Participation**: You are expected to participate in in-class discussions and be part of an active learning environment. In-class participation will be evaluated in terms of attendance, participation in class activities, and occasional in-class quizzes.

- **Online Exercises**: For each chapter of the textbook, you are expected to take the corresponding online exercise at eCollege. Exercises will be on the material from the chapter.

- **Writing Assignments**: We will have a number of writing assignments throughout the semester. These are sometimes based on example data and require use of downloaded data, computer and/or calculator-based analysis and interpretation and communication of results. (They imitate free response questions in AP exams.)

- **Chapter Tests**: The Chapter Tests consist of math and/or calculator problems.

- **Midterm and Final Exams**: There will be comprehensive, written, proctored midterm and final exams that will include multiple-choice questions and free-response questions on the material learned in the course.

- **Final Project**: Toward the end of the year, you are expected to work on one of the following projects:
  - Conduct a statistical study on the topic that you are interested in. Collect data and perform statistical analysis using the methods you learn in the course. Present the results and draw meaningful conclusions from them.
  - Do research on one of the philosophical/historical discussions about concepts/methods you see in the course. Present the current state of discussion and develop your own position on the issue.