Business Stats

Northeastern University - College of Business Administration

MGSC 2301: Business Statistics – Spring 2022

Instructor Information

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Office:	306 HA
Office Hour:	Friday 12-1pm

Course Overview

The objectives of this course are:

- To provide you with an understanding of statistical methods and techniques and their usefulness in the decision-making process.
- To expose you to the methods of descriptive, inferential statistics and regression analysis; and how they can be used to solve business problems.
- To improve upon your data analysis and computer skills.
- To provide you with the necessary tools for critical evaluation, correct interpretation, and presentation of the results of statistical analyses.

Required Textbook and Software

1) <u>Statistics for Business and Economics</u>, by Anderson, Sweeney, and Williams, 14th edition, Cengage Learning.

2) Excel / SPSS

Course Organization

- This section will follow the **In-Person** course format. Class will not be recorded.
- Participation in the course is imperative, including in-class discussions, assignments, and team projects. **Absences will hurt your preparation and your participation grade.**
- The course web page is the Canvas system. Course materials and announcements will be posted on the course site.
- The textbook is quite easy to read and covers a lot of ground. However, some of the topics are not covered in depth. Class discussions, handouts, and lecture notes will fill these gaps.

Course Policies

- You are expected to read through the assigned chapters and familiarize yourself with the content before class. Be prepared to participate in class discussions.
- Please refer to the Class Preparation section of the Assignments section before each session to know what your preparation task for the next session is.
- To maximize your learning, you should work on parts of the homework assignments throughout the week, as we cover the relevant topics in class.
- Anyone caught cheating will be dismissed from the course immediately with a grade of F. Students should familiarize themselves with Northeastern's policies on academic honesty and integrity.
- If you have any technical issues, it is important you contact the proper Help channels. Please plan properly when you have deliverables to make sure that if there is a problem with the technology aspect, there is enough time to fix it.
  - Northeastern's IT Help Desk 373.4357 and/or **help@northeastern.edu (mailto:help@northeastern.edu)**
  - LockDown Browser has "Help Center" button located on the toolbar.
  - Canvas Support Live Chat (in the help option in the toolbar) or call (1-833-450-3937).

Homework Assignments

- We will have weekly assignments to make sure we are caught up to all the concepts of the week. Non-submission counts as a zero score.
- Each day of late submission will result in 15% reduction in the assignment grade. Late submissions will be measured and proportionally implemented by Canvas.
- No submission will be accepted after publishing the assignment solutions. Solutions may be published one day after the due date, therefore plan accordingly to make submissions on time.
- All assignments must be typed and uploaded to Canvas. Hand-written assignments will not be accepted.

- Acceptable file formats include Word, Excel, Pdf.
- Assignments will typically be graded within 1-2 weeks.
- You will have one week to discuss your assignment grade after it has been released.

Examination

- There will be <u>three exams</u>. We will discuss the details of the exams throughout the semester.
- Any material covered in class lectures, videos and chapter readings are fair game for exams.
- The tests are set up so to challenge your "critical thinking" skills. They are thought provoking.
- Tests will be open book and will be in online format using the Canvas.
- All answers must be uploaded on Canvas during the test. No late submission is accepted.
- If you miss an exam without proper notification prior to the scheduled date, you will not be allowed to make up the exam and will receive zero for that exam.

Daily Quizzes

- We will have a short quiz at the beginning of most sessions.
- Quizzes will cover the material that you are required to read before the session in addition to the materials covered in the recent prior sessions.
- Quizzes can only be taken in their designated time. No late submission is possible.
- One third of the quizzes' points are extra points toward the final grade. Grab this opportunity to improve your final grade.

In Class Activities

- You are expected to attend every class session and to participate in the discussions. Please note that **attendance is not the same as participation**; it is possible to attend classes without participating.
- Use of mobile phone in class is prohibited. Laptops and tablet can only be used for the course purpose.

Determination of Course Grades

The following provides a percentage allocation of each component:

Homework: 34%

Quizzes: 24%

Exams: 50%

Total   108% (8% extra credits)

Instructor contract and reply policy

- You may visit me at the office hours. No prior appointment is required for the office hour.
- You can also email me anytime. During the week you can expect a reply within 24 hours. Over the weekend, you can expect a reply within 48 hours. Please include your full name, course name, section on all correspondence with your instructor.

The syllabus operates as our document of mutual understanding; it represents our agreement. Changes may be made to it as our progress dictates. Such changes will be discussed in class and class members will be responsible for all changes.

COURSE OUTLINE

Topic and Readings

Syllabus. Course introduction and objectives; data measurement (nominal, ordinal, interval and ratio) and types of variables (quantitative and qualitative). Project Discussion and Team Formation. Sections 1.1-1.3

Population parameter vs. sample statistics. Tabular and Graphical Presentations. Summarizing qualitative and quantitative data.

Sections 1.4 and 1.5. Sections 2.1, 2.2, and 2.4 (only scatter diagram)

Measures of central tendency: Mode, Median, and Mean. Measures of location: quartiles and percentiles. Chapter 3.

Measures of dispersion (variability): range, interquartile range, variance, and standard deviation; coefficient of variation. Measures of distribution shape and Boxplot. Chapter 3.

Introduction to probability. Random variables; discrete probability distributions; expected value and variance. Chapters 4 and 5

Uniform and Normal probability distribution.   Chapter 6 (section 6.1; 6.2)

Continued. Normal probability distribution.   Chapter 6 (section 6.1; 6.2)

Exam 1

Simple random samples; Introduction to Central Limit Theorem. Chapter 7.

Sampling distribution of the mean and the proportion. Chapter 7: Sections 7.1-7.8.

Confidence interval for a population mean. Chapter 8: Sections 8.1-8.2.

Confidence interval for the population proportion. Chapter 8.

Hypothesis testing for a population mean. One- and two-sided tests of significance; Type I / Type II errors. Readings: Sections 9.1-9.3

Hypothesis testing for a population mean continued. Use and interpretation of p-values. Tests of hypotheses involving the population proportion.   Sections 9.3-9.5. Lecture notes

Project Assignment - Topic Selection

Exam 2

Tests involving the differences between two population means. (Cases 1 and 3). Chapter 10.

Introduction to correlation analysis and simple linear regression. Section 3.5. Chapter 14.

Determining the equation of the regression line. Model assumptions and residual analysis.

Interpretation and calculation of regression coefficients. Tests of significance. Prediction and confidence intervals. R^2 values. Chapter 14.