EC 272 Advanced Applied Statistics

Quinnipiac University
Department of Economics, College of Arts and Sciences

Spring 2026

Instructor Details

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- **Email Hours:** 8:00 PM to 9:00 PM
- **Office Hours:** MoWeFri 3:00PM to 4:15PM or by appointment
- **Office Location:** Echlin Center 234

Class Schedule

- **Location:** Echlin Center 205
- **Time:** MoWeFri 2:00 PM - 2:50 PM

Course Description

Advanced Applied Statistics is a three-credit course designed to provide students with advanced statistical methods essential for empirical research in economics, business, and social sciences. This course emphasizes practical applications of statistical techniques using MS-Excel as a computational tool. Students will develop proficiency in hypothesis testing, regression analysis, and time series forecasting—skills critical for data-driven decision making in academic research and professional practice.

Catalog Description: This course teaches statistical methods and concepts used in business decision making and social science research. Topics include sampling distributions, estimation, hypothesis testing, correlation, linear regression and forecasting.

Prerequisites: MA 170, MA 176, MA 206, or MA 275

Course Objectives

This course aims to equip students with the statistical tools necessary for rigorous empirical analysis in economics, business analytics, and policy research. The curriculum emphasizes both theoretical foundations and practical implementation of statistical methods. Through hands-on computational exercises and real-world applications, students will develop skills to analyze data, test hypotheses, and communicate statistical findings effectively. Upon completion of this course, students will be able to conduct independent statistical analyses and critically evaluate empirical research in their field.

Learning Outcomes

The successful student in this class will be able to:

- Apply sampling theory to construct and interpret confidence intervals for population parameters.

- Conduct hypothesis tests for means and proportions in single and two-population settings.

- Evaluate the statistical and practical significance of empirical findings.

- Estimate and interpret simple and multiple linear regression models.

- Assess regression model assumptions and diagnose potential violations using residual analysis.

- Select appropriate predictor variables and specify regression models for applied research questions.

- Apply time series methods to analyze temporal patterns and generate forecasts.

- Implement statistical analyses using MS-Excel.

- Interpret statistical output and communicate findings to both technical and non-technical audiences.

- Critically evaluate the validity and limitations of statistical analyses in published research.

Required Materials

Textbook: Statistics for Business and Economics by *Jeffrey D. Camm, James J. Cochran, Michael J. Fry, Jeffrey W. Ohlmann, David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, 15th Edition*. An ebook is included with WebAssign.

WebAssign for Statistics for Business and Economics, 1 term Instant Access (15th Edition)

- ISBN: 9780357715888
- Direct Price: $169

or…

Cengage Unlimited Subscription – 4-month access (Instant Access)

- Direct Price: $149.99 (4 months access)

Cengage Unlimited is a 4-month or 12-month subscription that gives you access to the required WebAssign materials above, as well as any other Cengage materials you may need for other classes. Also includes free print rentals, just pay S&H. Learn more: https://www.cengage.com/unlimited/

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Lectures

All lectures will be delivered in person at Echlin Center 205 (except in emergencies). Attendance is not mandatory but strongly encouraged. You are responsible for everything in the assigned textbook chapters as well as what is covered in the lectures. Therefore, you need to be present, keep up with the reading, and pay attention. If you miss an assignment or analysis of an issue you will need to get the notes from someone who was present. You are also responsible for everything posted on Blackboard and WebAssign.

Blackboard and WebAssign

You are responsible for everything posted on Blackboard. I strongly recommend that you get into the habit of logging in regularly and reviewing all announcements and notifications, as they may contain important information.

On WebAssign you will be able to find:

- Online homework assignments to complete.

On Blackboard, you will be able to find:

- This syllabus, lecture slides, and announcements relevant to the course.
- Links to the WebAssign homework assignments.
- Any extra material deemed necessary for the course.

Grading Scheme

Your final grade for this course will be based on post-lecture online homeworks, online midterm exams, a group project, and an oral examination. The contribution of each component to your final grade is as follows:

- **7 Homeworks (35%)**: Online homework assignments on WebAssign after covering each chapter to reinforce key concepts and provide practice. Students will have at least 5 days to finish these homework assignments.

- **2 Midterm Exams (30%)**: 2 online multiple choice questions exams. **These exams will not be cumulative**.

- **Group Project (20%)**: Students will work in groups to analyze a dataset and present their findings. A printed copy of the group report is due on the day of the oral examination. All data analysis must be completed using Microsoft Excel. More information about the project will be provided in class.

- **Oral Examination (15%)**: A short interview style exam with each group to discuss their project findings, justify methodological choices, and demonstrate understanding of the statistical techniques used. Students will answer concept-focused questions based on their project work. These will be conducted in-person and all group members must be present to be able to attempt the exam unless there is a **valid AND documented excuse**.

All homework assignments will be submitted electronically through WebAssign. The midterm exams will be conducted during the regular class time. The oral exam is scheduled for **Friday, May 8, 2026 at 3:30 PM**.

There will be absolutely NO make-up for any of the homework after the deadline has passed. I will not accept explanations like "the server did not save my work" or "the internet connection broke down". Make-up for the midterm and oral examination will not be possible unless you have a valid and documented excuse.

Grading Policy

I will aim for a median score of 84 overall in your final raw scores, which is based on your performance on homework, midterms, and the oral exam. If the class median is less than 84, I will curve the grade by adding points equally to obtain the median score of 84. If your final raw score is a non-integer, I will ROUND UP to

get the whole number. Keep in mind, your final raw score will be curved if required but not scores on each individual component.

Letter Grade	Numerical Range	Grade Pt. Value
A	93-100	4.00
A-	90-92	3.67
B+	87-89	3.33
B	83-86	3.00
B-	80-82	2.67
C+	77-79	2.33
C	73-76	2.00
C-	70-72	1.67
D	60-69	1.00
F	0-59	0.00

Academic Integrity and AI use policy

Cheating will result in the application of the University's Academic Integrity Policy. Absent a clear statement from a course instructor granting permission, the use of Generative AI tools to complete an assignment or exam is prohibited. The unauthorized use of AI shall be treated similarly to the unauthorized use of materials and/or plagiarism in accordance with the University's Academic Integrity Policy. You may find more on that here https://catalog.qu.edu/handbooks/undergraduate/university-policies/academic-integrity-policy/.

Accessibility

Quinnipiac University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me.

If you have a disability, or think you may have a disability, you may also want to meet with the Office of Student Accessibility, to begin this conversation or to request reasonable accommodation. Quinnipiac University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. Please contact the Office of Student Accessibility by emailing access@qu.edu, or by calling (203) 582-7600. If you have already been approved for accommodation through the Office of Student Accessibility, please meet with me so we can develop an implementation plan together.

Title IX

Quinnipiac University is committed to maintaining an environment free from discrimination and harassment. If you have experienced sexual harassment, sexual assault, dating violence, domestic violence, or stalking, please know that resources are available to you. Confidential resources include the Counseling Center and Health Services. For more information, please contact the Title IX Coordinator at (203) 582-3710.

Tentative Schedule

The following schedule is tentative and subject to change. Any changes will be announced in class and posted on Blackboard.

Dates	Topics	Chapters
Jan 21, 23, 26	Course Introduction; Review of Probability & Sampling	Ch 7.1-7.2
Jan 28, 30; Feb 2	Sampling Distributions	Ch 7.3-7.7
Feb 4, 6, 9	Confidence Intervals	Ch 8.1-8.4
Feb 11, 13, 16	Hypothesis Testing I	Ch 9.1-9.3
Feb 18, 20, 23	Hypothesis Testing II	Ch 9.4-9.5
Feb 25, 27; Mar 2,4	Two-Population Inference I; Two-Population Inference II	Ch 10.1; 10.3
Mar 6	**Midterm 1**	**Ch 7-10 (lecture material only)**
Mar 9-14	**Spring Recess**	**No Classes**
Mar 16, 18, 20	Introduction to Regression	Ch 14.1-14.2
Mar 23, 25, 27	Simple Linear Regression	Ch 14.3-14.5
Mar 30; Apr 1	Multiple Regression I	Ch 15.1-15.3
Apr 3	**Good Friday**	**No Class**
Apr 6, 8, 10	Multiple Regression II	Ch 15.4-15.5
Apr 13, 15, 17	Model Building & Selection	Ch 15.6-15.7, 15.9
Apr 20, 22, 24, 27, 29	Time Series Analysis I; Time Series Analysis II	Ch 17.1-17.4
May 1	**Midterm 2**	**Ch 14,15,17 (lecture material only)**
May 8	**Group Project Submission; Oral Examination**	**Cumulative (lecture material only)**

Note: All homework assignments will be available after we finish each chapter.

Tips for Success

- **Attend lectures regularly.** Each topic builds on previous concepts, making it harder to catch up if you fall behind.

- **Do not be disruptive during the lectures.** Please be quiet and respectful during lectures so that all students can participate. This means no talking (unless given permission) and no sounds coming from phones/laptops. You may use a laptop, tablet or your phone to take notes, but all electronic equipment must be quiet.

- **Read assigned chapters before class.** Preparation improves comprehension and enables more productive class discussions.

- **Begin assignments well before deadlines.** Starting early allows time to seek help when needed.

- **Solve problems consistently.** Mastery of statistical methods comes from repeated practice, not passive reading.

- **Visit during office hours.** Take advantage of opportunities for individual help before difficulties accumulate.

- **Collaborate with classmates.** Teaching material to peers reinforces your own understanding.

- **Analyze graded work carefully.** Understanding errors on assessments prevents repeating them.

- **If you are struggling or experiencing difficulties, please contact me.** Email me about any academic or other concerns; in most cases we can resolve academic issues together. If I am unable to assist, I will refer you to someone who can help with non-academic matters.