

Course Outline

Department of Economics
School of Business and Economics

ECON 3330-3
Economics and Business Statistics 2 (3,0,0)

Calendar Description

Building on ECON 2320: Economics and Business Statistics 1, students examine advanced statistical techniques and methods and their applications in business and economics. Topics include inferences about population variance, including hypothesis testing and confidence intervals; analysis of variance and experimental designs; simple and multiple regressions; time series analysis and forecasting; statistical quality control; and decision analysis. Students are required to apply statistical techniques using Excel and/or Minitab.

Educational Objectives/Outcomes

Upon completing this course, students will be able to:

1. Demonstrate a sound knowledge and understanding of hypotheses testing.
2. Conduct an analysis of variance under various experimental designs.
3. Estimate simple and multiple regression models and interpret the results.
4. Use time series analysis and forecasting models to make better forecasts.
5. Use non-parametric methods to make statistical inferences.
6. Apply statistical tools to monitor quality of products and services.
7. Develop an optimal decision strategy when faced with uncertainty.
8. Apply statistical techniques to various fields such as marketing, supply chain management, finance, accounting, and economics using real-world data.
9. Demonstrate the ability to use Excel® and Minitab® in estimating applied statistical procedures, methods, and models.

Prerequisites

ECON 1220 or both ECON 1900 and ECON 1950; ECON 2320 or equivalent; MIST 2610

Note: Students cannot receive credit for more than one of ECON 2330, ECON 3330, STAT 2410, and STAT 3060. ECON is for non-business students.

Co-requisites

None

Texts/Materials

Anderson, Sweeney, Williams, Camm, and Cochran, Statistics for Business & Economics, 12th Edition, South-Western, 2014.

Student Evaluation

Participation	0-20%
Assignments/quizzes	0-20%
Project	0-25%
Midterms	30-60%
Final exam	30-50%

Course Topics

1. Inference About Population Variance
 - Inferences about a population variance
 - Inferences about two population variances
 - Selected nonparametric test of hypothesis
2. Comparing Multiple Proportions for Three or More Populations, Test of Independence
 - A multiple comparison procedures
 - Test of independence
 - Tests of goodness of fit
3. Analysis of Variance and Experimental Designs
 - Concept of ANOVA.
 - Comparison of several population means
 - Completely randomized design
 - Randomized block design
 - Factorial experiment
4. Regression Models
 - Simple linear and multiple regression models and regression equations
 - Least square method
 - Simple and multiple regression model assumptions
 - Coefficient of determination
 - Testing for significance
 - Confidence and prediction intervals
 - Categorical independent variables and interpreting the parameters
 - Interaction
 - Determining when to add or delete variables
5. Time Series Analysis and Forecasting

- Time series patterns
- Forecast accuracy
- Moving average and exponential smoothing
- Trend projection
- Seasonality and trend
- Time series decomposition

6. Statistical Methods for Production Quality Control

- Philosophies and frameworks
- Statistical process control
- Acceptance sampling

7. Decision Analysis

- Problem formulation
- Decision making with probabilities
- Decision analysis with sample information
- Computing branch probability using Bayes' Theorem

Methods for Prior Learning Assessment and Recognition

As per TRU policy.

Attendance Requirements – Include if different from TRU Policy

As per TRU policy.

Special Course Activities – Optional

Use of Technology – Optional