



National Taiwan University of Science and Technology

2021 Summer Program

BUS 265 Business Analytics II

Course Outline

Course Code: BUS 265

Instructor: Dr. Yunshan (Victor) Lian

Home Institution: University of Wisconsin

Office Hours: TBA and by appointment

Email: victor.lian@hotmail.com

Credit: 4

Course Description:

This course introduces the concepts of modeling relationships contained in data and the use of linear models to make predictions in business. Topics include estimation, hypotheses testing, statistical inference, analysis of variance and linear regression techniques. The course also introduces students to fundamentals of linear programming to solve optimization problems in business.

Prerequisites:

1. BUAL 2600 or equivalent with a grade of C or better
2. Essential and expected knowledge: Proficiency in elementary algebra and geometry. Familiarity with recent versions of MS Word, PowerPoint, and Excel. Deficiencies in any of these areas should be self-remediated.

Course Objectives:

1. Understand the importance of data-driven business decisions using the analytics process
2. Understand the basic role of probability in business decision making.
3. Apply hypothesis testing and statistical inferential procedures to aid business decisions.
4. Build regression models for estimation and prediction in business.
5. Understand the basics of forecasting/predictive modeling.
6. Understand regression models that involve quantitative and qualitative independent variables.



Required Textbooks:

- Business Analytics, Methods, Models, and Decisions (3rd Edition), by James R. Evans, Pearson Higher Education, 2020, ISBN-13: 978-0-13-523167-8
- The latest version of Microsoft Excel will be used in this class.
- XLSTAT MS Excel add-in purchase required.
- Example files you are required to download for class:
https://media.pearsoncmg.com/ph/esm/esm_evans_eba3e_20/cw/eba3e_companion_website.html

Grading & Evaluation:

	Assignment	Possible Points
1	Class participation 4@15	60
2	Weekly assignments 4@25	100
3	Midterm exam	100
4	Final exam	100
	Total	360

Late submission is not acceptable, unless you can notify the instructor before the due date with a legitimate reason and a proof (e.g. doctor's note).

Academic Integrity

Plagiarism is absolutely unacceptable. Make sure all responses are written in your own words and that every file submitted is your own file created by you. Copying from someone's work will result in a zero for everyone involved, or failing the whole course.

Course Schedule:

Week1

Chapter 6. Sampling and Estimation.

Statistical Sampling, Estimating Population Parameters, Unbiased Estimators, Errors in Point Estimation, Sampling Error, Sampling Distributions, Sampling Distribution of the Mean, Interval Estimates, Confidence Intervals, Confidence Interval for the Mean with Known Population Standard Deviation, The t-Distribution, Confidence Interval for the Mean with Unknown Population Standard Deviation, Confidence Interval for a Proportion, Prediction Intervals

Weekly assignment

Week2

Chapter 7. Statistical Inference

Hypothesis Testing, One-Sample Hypothesis Tests, Potential Errors in Hypothesis Testing, Selecting the Test Statistic, Finding Critical Values and Drawing a Conclusion, Two-Tailed Test of Hypothesis for the Mean, p-Values, One-Sample Tests for Proportions, Confidence



Intervals and Hypothesis Tests, Two-Sample Hypothesis Tests, Two-Sample Tests for Differences in Means, Two-Sample Test for Means with Paired Samples, Two-Sample Test for Equality of Variances, Analysis of Variance (ANOVA), Chi-Square Test for Independence

Weekly assignment

Mid-term exam

Week3

Chapter 8. Trendlines and Regression Analysis

Simple Linear Regression, Least-Squares Regression, Regression as Analysis of Variance, Testing Hypotheses for Regression Coefficients, Confidence Intervals for Regression Coefficients, Residual Analysis and Regression Assumptions, Checking Assumptions, Multiple Linear Regression, Correlation and Multicollinearity, Regression with Categorical Independent Variables, Categorical Variables with More Than Two Levels, Regression Models with Nonlinear Terms

Weekly assignment

Week4

Chapter 9. Forecasting Techniques

Qualitative and Judgmental Forecasting, Historical Analogy, The Delphi Method, Indicators and Indexes, Statistical Forecasting Models, Forecasting Models for Stationary Time Series, Moving Average Models, Error Metrics and Forecast Accuracy, Exponential Smoothing Models, Forecasting Models for Time Series with a Linear Trend, Double Exponential Smoothing, Regression-Based Forecasting for Time Series with a Linear Trend, Forecasting Time Series with Seasonality, Regression-Based Seasonal Forecasting Models, Holt-Winters Models for Forecasting Time Series with Seasonality and No Trend, Holt-Winters Models for Forecasting Time Series with Seasonality and Trend, Selecting Appropriate Time-Series-Based Forecasting Models, Regression Forecasting with Causal Variables

Introduction to Prescriptive Analytics: Linear Optimization

Weekly assignment

Final exam