Course Syllabus 119382

Quantitative Analysis in Agricultural Economics II 3(3-0)

Uses of statistical theory as tools in data collection, analysis, and prediction of agricultural economic variables. Sound sampling methods. Functional relationships among variables in agricultural economics and their correspondent coefficients. Time series analysis. Analysis of experimental outcome against theoretical background in agricultural economics.

Course Outline

Chapter 1 Introduction to Probability
- Experiments, Counting Rules, and Assigning Probabilities
- Events and Their Probabilities
- Some basic Relationships of Probability
- Conditional Probability
- Bayes's Theorem

Chapter 2 Random Variable Probability Distribution
- Random Variable
- Discrete Probability Distribution
- Distribution Function and Density Functions
- Continuous Probability Distribution
- Joint Probability Distribution
- Marginal Probability Distribution
- Mathematical Expectation and Their Properties
- Variance and Their Properties

Chapter 3 Discrete Probability Distribution
- Uniform Probability Distribution
- Binomial Probability Distribution
- Multivariate Probability Distribution
- Poisson Probability Distribution
- Hypergeometric Probability Distribution
- Negative Binomial and Geometric Distribution

Chapter 4 Continuous Probability Distribution
- Uniform Probability Distribution
- Normal Probability Distribution
- The Gamma Distribution
- Exponential Probability Distribution
- The Beta Distribution
- Chi-square Probability Distribution
- T Probability Distribution
- F Probability Distribution

Chapter 5 Sampling Survey
- Simple Random Sampling
- Stratified Simple Random Sampling

- Cluster Sampling
- Systematic Sampling

Chapter 6 Sampling Distribution

- Introduction to Sampling Distribution
- Point Estimation
- Sampling Distribution of Means
- Sampling Distribution of Proportions
- Sampling Distribution of Difference Between the Means
- Properties of Point Estimation

Chapter 7 Interval Estimation

- Interval Estimation of a Population Mean
- Interval Estimation of a Population Proportion
- Interval Estimation of Difference Between the Means of Two Population
- Interval Estimation of Difference Between the Proportions of Two Population
- Determining the Sample Size
- Interval Estimation of $\overline{D}$

Chapter 8 Hypothesis Testing

- Developing Null and Alternative Hypotheses
- Type I and Type II Errors
- Test about Population Mean
    - Known Variance
    - Unknown Variance
- Test about Population Proportion
- Test about Difference Between the Means of Two Population
- Test about Difference Between the Proportions of Two Population

Chapter 9 Sampling Survey

- Simple Random Sampling
- Stratified Simple Random Sampling
- Cluster Sampling
- Systematic Sampling

Chapter 10 Analysis of Variance

Chapter 11 Simple Linear Regression

- Simple Linear Regression Model
- Least Squares Method
- Coefficient of Determination
- Model Assumption
- Testing for Significance

Chapter 12 Forecasting

- Components of a Time Series
    - Trend Component
    - Cyclical Component
    - Seasonal Component
    - Irregular Component
- Smoothing Methods

- Trend Projection
- Trend and Seasonal Components
    - Multiplicative Model
    - Calculating the Seasonal Indexes
    - Deseasonalizing the Time Series
    - Using the Deseasonalized Time series to Identify Trend
    - Seasonal Adjustments
    - Cyclical Component