

Course Syllabus for
Applied Management Science in Agricultural Systems Science II
AGET 785

Department of Agriculture, Geosciences, and Natural Resources
College of Agriculture & Applied Sciences

- Course Title: Applied Management Science in Agricultural Systems II (3)
Course Discipline: Agricultural Engineering Technology (AGET)
Course Number: AGET 785
Classification: Graduate
Credit: 3 hours
Clock Hours: Modular presentation via the Internet
Course Prerequisites: MSANR requirements
- Instruction Type: Web-based-Online (Blackboard and audio enhanced PowerPoint)
- Instructor: Timothy N. Burcham, P.E., Ph.D.
Professor
- Address: 254 Brehm Hall, Univ. of Tennessee at Martin, Martin, TN 38238
email: tburcham@utm.edu
Phone: (731) 881-7275 (Office)
(731) 881-7968 (FAX)
- Office Hours: 9:00 AM to 5:00 PM Mon – Fri or by appointment
- Person with a Disability: Any student eligible for and requesting academic accommodation due to a disability is requested to provide a letter of accommodation from PACE (Phone: 587-7195, Location: Gooch Hall, Rm 124) or Student Academic Support (Phone: 587-7744, Location: Clement Hall Rm 208). Please submit this documentation during the first 2 weeks of the semester.
- Textbook: Applied Management Science: Modeling, Spreadsheet Analysis, and Communication for Decision Making, 2nd Edition, Copyright 2002. Authors: John A. Lawrence and Barry A. Pasternack. The textbook includes a CDROM with example spreadsheets,
- Lecture Format: Lecture modules will be posted using the UTM Blackboard interface. It is the student's responsibility to explore and complete each module by the assigned date (as determined by the instructor). *This is NOT a self-paced course. It is NOT a self-study. It is NOT a correspondence course. Quizzes and cases studies will be assigned and completed by the student according the instructor posted due date. Mid-term and Final Examinations will follow the published UTM calendar for the semester the course is offered.*

COURSE REQUIREMENTS/EXPECTATIONS

- Grading: 25% - Case studies (A formal management report including: mathematical formulation, spreadsheet solution(s), and recommendation(s)). Examples of the management reports are illustrated and described in the required text. Case studies will be assigned for each major topic area covered.
45% - Online Quizzes
15% - Mid-term Exam (proctored)
15% - Final Exam (proctored)
- Grade Assignment: 90 – 100 average = A
80 – 90 average = B
70 – 79 average = C
65 – 69 average = D
< 65 average = F
- Punctuality: Each lecture module and associated assignments will have a definite completion date (as assigned by the instructor). Assignments, case studies, quizzes, etc. turned in after the posted due date will receive a 10-point deduction per day late.

COURSE PURPOSE, GOALS, AND OBJECTIVES

Catalog Description:

785 Applied Management Science in Agricultural Systems II
(3) Probability concepts, decision making under uncertainty and forecasting for applied decision making in agriculture. Continued development of computer and writing skills necessary for finding and communicating results professionally. The theory and implementation of decision analysis and forecasting techniques as well as inventory, queuing, and simulation models are examined (Same as AGEC 785). Prereq: AGET 784 or AGEC 784.

Course Purpose,

Goals & Objectives: To find optimal solutions for agricultural and natural resources related industries and agencies using management science principles.

Student Outcome: For the student to be competent in formulating and applying management science principles for solving “real-world” problems in agricultural and nature resources related businesses and industries.

AGET 785 Course Outline

(This outline is subject to change based on class progress and the instructor's discretion.)

Chapter 6

Decision Models

Introduction to Decision Analysis
Payoff Table Analysis
Decision-Making Criteria
Expected Value of Perfect Information
Bayesian Analyses-Decision Making with Imperfect Information
Decision Trees
Decision Making and Utility
Game Theory
Summary

Chapter 7

Forecasting

Introduction to Time Series Forecasting
Stationary Forecasting Models
Evaluating the Performance of Forecasting Techniques
Forecasting Time Series that Exhibit Linear Trend
Time Series with Trend, Seasonal, and Cyclical Variation
Other Forecasting Techniques
Summary

Chapter 8

Inventory Models

Overview of Inventory Issues
Economic Order Quantity Model
Determining Safety Stock Levels
EOQ Models with Quantity Discounts
Production Lot Size Model
Planned Shortage Model
Review Systems
Single-period Inventory Model
Summary

Chapter 9

Queuing Models

Introduction to Queuing Models
Elements of the Queuing Process
Measures of Queuing System Performance
M/M/1 Queuing Systems
M/M/k Queuing Systems
M/G/1 Queuing Systems

M/M/k/F Queuing Systems (Finite Queue Length)
M/M/1//m Queuing Systems (Finite Customer Population)
Economic Analysis of Queuing Systems
Tandem Queuing Systems
Summary

Chapter 10

Simulation Models

Overview of Simulations
Monte Carlo Simulation
Simulation of Inventory System Using a Fixed Time Approach
Simulation of a Queuing System Using a Next-Event Approach
Random Number Mappings for Continuous Random Variables
Simulation of an M/M/1 Queue
Conducting Simulations Using Crystal Ball
Advantages and Disadvantages of Simulation
Summary

Additional topics (time permitting)

Quality Management Models
Markov Process Models
Nonlinear Models: Dynamic, Goal, and Nonlinear Programming
Linear and Nonlinear Regression