



Quantitative Methods – MAT 540

Prerequisite: MAT 300

Quarter	Fall 2006
Meeting Days/Time	Wednesdays, 6:15 – 10:00 PM
Instructor	Tristan Hubsch
Instructor Phone	(703) 798-3622
Instructor E-mail	thubsch@mac.com
Instructor Office Hours/Location	Saturday 10:00 AM – 2:00 PM, by appointment
Academic Office Phone Number	703-330-8474 (voice), 703-330-8417 (fax)

INSTRUCTIONAL MATERIAL

(including all mandatory software)

1. Taylor, B. W. (2005). *Quantitative methods: Custom edition*. Pearson.
2. Scientific Calculator Required
3. Software required: Excel, with the “Solver” Ad-on module installed & activated.
Optional: QM for Windows; Excel QM; Crystal Ball (in the CD accompanying the textbook)

I. COURSE DESCRIPTION

Applies quantitative methods to systems management (Decision Theory), and/or methods of decision-making with respect to sampling, organizing, and analyzing empirical data.

II. EXPECTED LEARNING OUTCOMES

Upon the successful completion of this course, the student will be able to:

- a. Explain the theories and practices of production and operations management.
- b. Develop a basic understanding of quantitative decision-making models and their application
- c. Explain some of the most widely used quantitative methods

**Course instructor may provide additional outcomes in this section as well.*

III. EXPECTED WEEKLY LEARNING OUTCOMES

The following weekly learning outcomes will be addressed:

Week 1 (09/27: Chapters 1 & 2)

- Describe the nature of the management science approach to problem solving.
- Describe modeling techniques used in management science.
- Use a mathematical model to perform break-even analysis
- Use Excel QM macro to perform break-even analysis
- Identify some of the business usage of management science techniques
- Explain what a Decision Support System is
- Re-acquaint with the basic probability, statistics concepts used in management science.

Week 2 (10/04: Chapter 3)

- Understand the basic components and organization of a decision analysis problem
- Apply non-probabilistic and probabilistic criterion to solve a decision analysis problem
- Solve decision-making problems with QM for Windows
- Use Excel add-in TreePlan to construct and solve a decision tree
- Use decision tree to solve problems that requires a sequence of decisions
- Compute the expected values of perfect information and sample information
- Apply Bayesian analysis to determine if additional information is needed in the decision-making process.
- Use Utilities to better reflect the values of payoffs

Week 3 (10/11: Chapter 5)

- Describe the basic forecasting data patterns.
- Classify forecasting methods based on time frames.
- Describe the basic time series forecasting methods.
- Adjust forecasting data with the consideration of seasonal effect.
- Solve time series forecasting problems with Excel spreadsheet and QM for Windows
- Describe regression forecasting technique.
- Perform regression analysis with Excel and QM for Windows
- Evaluate the accuracy and adequacy of the forecasting methods

Week 4 (10/18)

- Review for the take-home Midterm Exam
- Take-home **Midterm Exam** (Ch. 1–3 & 5) handed out & posted on-line

Week 5 (10/25: Chapter 6)

- Take-home **Midterm Exam due at 6:15 PM**
- Describe what linear programming is and its components.
- Formulate a linear programming model from a description of the problem
- Solve a linear programming problem of two variables with graphical method
- Recognize irregular types of linear programming problems
- Understand the characteristics that identify a linear programming problem

Week 6 (11/01: Chapter 7)

- Solve linear programming problems with Excel spreadsheets
- Solve linear programming problems with QM for Windows
- Describe what sensitivity analysis is
- Perform sensitivity analysis on linear programming model parameters

Week 7 (11/08: Chapter 8)

- **Term-paper** topics announced and discussed
- Recognize various managerial problems to which linear programming can be applied
- Formulate and solve linear programming models of problems from some of the popular application areas such as Product Mix, Marketing, Investment, Transportation, Multi-Period Scheduling, Data Envelopment Analysis etc.

Week 8 (11/15: Chapter 9)

- Understand and identify basic types of integer programming models.
- Solve integer programming problems with graphical method
- Solve integer programming problems with Excel and QM for Windows.
- Formulate integer programming models of Fixed Charge and Facility Location Problem

Week 9 (11/22: Chapter 10)

- **Term-paper rough draft due**
- Describe the characteristics of transportation problems
- Formulate and solve transportation with Excel and QM with Windows
- Describe the characteristics of transshipment problems
- Formulate and solve transshipment problems with Excel and QM with Windows
- Describe the characteristics of assignment problems
- Formulate and solve assignment problems with Excel and QM with Windows

Week 10 (11/29: Chapter 4)

- Describe the basic concept, and fundamental of simulation techniques.
- Understand the basics of the Monte Carlo Process
- Understand the role of simulation technique plays in management science studies
- Use Excel to perform basic computer simulations
- Perform basic statistical analysis of simulation results
- Use Crystal Ball to perform computer simulations
- Interpret Crystal Ball simulation result
- Identify some areas of applications of computer simulation
- Take-home **Final Exam** handed out/posted on the web.

Week 11 (12/06)

- **Term-paper** and take-home **Final Exam due at 7:30 PM**

IV. COURSE OUTLINE

DATE	CHAPTER	INFORMATION
Week 1	1,2	Introduction of Management Science. Review of basic concepts from probability, statistics and basics
Week 2	3	Decision Analysis

Week 3	5	Forecasting
Week 4	—	Review; Midterm Exam handed out
Week 5	6	Midterm Examination due at 6:15 PM Linear Programming: Model Formulation and Graphical
Week 6	7	Linear Programming: Computer solution and Sensitivity Analysis
Week 7	8	Linear Programming: Modeling Examples
Week 8	9	Integer Programming
Week 9	10	Transportation, Transshipment and Assignment Problems
Week 10	4	Simulation; Computer Simulation with Excel and Crystal
Week 11	—	Term paper and Final Examination due at 7:30 PM

V. COURSE REQUIREMENTS AND TEACHING STRATEGIES

This course will be conducted with a variety of teaching methods seeking to encourage the student to build self-confidence. Ample emphasis will be placed on creating an environment that's amicable for group learning, and classroom discussion. Additionally, some outside readings and multi-media resources may be utilized when necessary. The instructor will function as a facilitator of discussion and group learning.

1. Mid-term examination
2. Final examination
3. Completion of all written and oral assignments
4. Active class participation
5. Regular class attendance

This section outlines major course events, including an overview of the conduct of the course and summarizes any basic mechanisms of course events (may include class sessions, group negotiation exercises, presentations, quizzes and examinations, etc). And describes the nature/context/intent of assignments, provides a basic classroom format, any reference or research requirements, due dates, turn in process, and any late work policy (if applicable).

All Graduate Courses

Writing Assignments

The objective of graduate level writing assignments is to promote attitudes and skills that will improve a student's ability to communicate in writing, develop research skills and documentation techniques, and encourage critical analysis of data and conclusions.

All graduate courses must include assignments totaling a minimum of ten pages of writing. The writing requirement may be fulfilled through one long research paper or several shorter writing projects such as journal reports, journal entries, book or article reviews, class projects or essay examinations as deemed by the instructor to be appropriate for the discipline.

Instruction and evaluation methods will vary by teacher and course, but some general guidelines apply. Students should be given clear task objectives and expectations for each writing assignment. In-class discussion of sample work and collaborative writing projects can provide guidance in addition to written feedback from instructors. When evaluating work, instructors should assess students' adherence to the assigned writing objectives, clear organization and presentation of their ideas, evidence of original thought and critical analysis, etc.

VI. EVALUATION METHODS

Final Grade	100.00%
Final Examination	35.00%
Mid-Term Examination	20.00%
Assignments	20.00%
Term Paper	15.00%
Class Participation	10.00%

This section outlines key objectives or assignments upon which a student's grade will be based; including how students will be assessed (including but not limited to exams, quizzes, group exercises, presentation, etc.).

Grading Scale

90-100	A
80-89	B
70-69	C
Below 60	F

*Note: In the graduate program, grades below "C" are considered as "F."

VII. UNIVERSITY NOTICES

Honor Pledge

All work submitted for this course is subject to the University's Academic Integrity Policy available in the Student Handbook and the University's Honor Pledge, printed below:

I have read and understand Strayer University's Academic Integrity Policy. I promise to conduct myself with integrity in the submission of all academic work to the University and will not give or receive unauthorized assistance for the completion of assignments, research papers, examinations or other work. I understand that violations of the Academic Integrity Policy will lead to disciplinary action against me, up to and including suspension or expulsion from the University. I understand that all students play a role in preserving the academic integrity of the University and have an obligation to report violations of the Academic Integrity Policy committed by other students.

Academic Integrity

Strayer University holds its students to high standards of academic integrity and will not tolerate acts of falsification, misrepresentation or deception. Such acts of intellectual dishonesty include, but are not limited to, cheating or copying, fabricating data or citations, stealing examinations, the unauthorized use of instructor editions of textbooks, taking an exam for another student or having another student take an exam intended for oneself, tampering with the academic work of another student, submitting another's work as one's own, facilitating other students' acts of academic dishonesty, using internet sources without citation and plagiarizing.

Information Literacy

The University recognizes the development of skills to find, retrieve, analyze, and use information is critical to the academic success of each student and to the fostering of continued lifelong learning and intellectual growth. Assignments supporting this development are included in many course syllabi as well as in the learning outcomes in all programs at all degree levels. Strayer is committed to adding value to its courses and programs through a defined Information Literacy Plan.

Course Participation Guidelines for Students

The University encourages open discussion within its courses and often asks students to draw from personal experience in their responses to course assignments. Though such information should be used

only for educational purposes, the University cannot guarantee that such information will remain confidential. Students are responsible for knowing the applicable policies of their employers and others with regard to the sharing of confidential information and using appropriate discretion. Additional care should be used when posting to online discussion boards where written comments are preserved. The University is not legally responsible for any inappropriate postings through its online discussion boards (i.e. those that violate University policy, defame another person, etc.). In order to preserve an open discussion within the classroom environment, students may choose to not specifically identify their current or previous employers by name or withhold other similar identifying information. Questions or concerns regarding this policy should be directed to the course instructor or the applicable Campus Dean, Strayer University Online Dean of Students or the Dean of Student Affairs.

Attendance Policy

Students are expected to attend all regularly scheduled classes. Should absences be necessary, students are responsible for the material covered during the absences. Faculty cannot grant requests for excessive amounts of make-up material, and they may request written documentation detailing the reason for the absences.

Excessive absences make it almost impossible for a student to meet the academic objectives of a course; they frequently cause a student to receive a lower grade, even though, the absences were unavoidable.

Strayer University requires all faculty members to take attendance during each class period and to records it accurately on their permanent roster. This data is available for verification of attendance by the appropriate governmental agencies and educational accrediting organizations.

A student who is absent from four consecutive class meetings, excluding holidays and emergency cancellation of classes, will be withdrawn automatically from that course. A student will be withdrawn automatically from a mini-session course when he/she misses two consecutively scheduled class meetings.

Grade Dispute Policy

If you have questions with regard to the grading policies in this course, please contact the instructor for clarification. Disputes with regard to final grades received in this course are handled in accordance with the University's grade dispute policy as set forth in the Student Handbook.

Inclement Weather Policy

In the event of inclement weather, consult the Strayer University student website at <http://studentserver.strayer.edu> for information on University closings and delays.

VIII. UNIVERSITY SERVICES

Learning Resources/Library

Learning resources to help students succeed academically are available through the Strayer University Library. Each campus Learning Resources Center (LRC) offers print resources, books, and periodicals for research. Circulating books located at any LRC may be requested for use through the LRC Manager.

Library resources are also available online, and can be accessed from any computer connected to the Resource Lab located on the e-College course web pages. The online suite of databases under EBSCOHost and other LRC resources can be accessed through the University's website at <http://online.strayer.edu/lrc/index.htm>. They provide thousands of full text periodicals, over 25,000 electronic books, radio and TV transcripts, the complete Encyclopedia Britannica, access to the Strayer University library catalog, online tutorials, and useful links to internet resources. A tour of the LRC is highly recommended and can be scheduled through your LRC Manager.

Tutoring Services

Tutoring is offered for undergraduate level courses in subject areas such as English, writing skills

development, mathematics, accounting and computer information systems. All students have access to these free tutoring services-whether they are taking classes at a brick-and-mortar campus or via Strayer Online. Tutoring services are provided by either a full-time or part-time faculty member with a strong background in the subject area in which he or she is tutoring.

Campus based tutoring schedules vary slightly, but typically tutoring services are available Monday through Friday in the late afternoon and Saturday mornings in order to accommodate the needs of our student body. Students should check with their Academics Office for a tutoring schedule and information on how to schedule an appointment.

Notice to Students with Disabilities

Strayer University welcomes students with disabilities and provides reasonable accommodations and auxiliary aids and services in accordance with applicable law. A disabled student is not required to disclose his/her disability to the University unless the student wishes the University to provide a reasonable accommodation. If you desire accommodation for a disability in this course and have not already contacted the office of the Dean of Student Affairs with your request, please do so immediately. Requests may be submitted to: 1133 Fifteenth Street, NW, Suite 300, Washington, D.C. 20005, Phone: (202) 419-0400, Fax: (202) 419-1423.

Security on Campus

Any person in immediate danger due to crime or emergency while on University property should contact local police immediately by dialing 911. When the emergency has subsided, the victim should also report the incident as soon as possible to the Campus Director of the location where the incident occurred. The University's Campus Security Report is available on the Strayer University student website at <http://studentserver.strayer.edu>.

IX. HOMEWORK ASSIGNMENTS

#	Due	Content
1	10/04	Ch.1: 3, 7, 13, 17, 21 Ch.2: 11, 21, 25, 31, 37
2	10/11	Ch.3: 3, 7, 11, 15, 19, 23, 27, 31, 33, 43
3	10/18	Ch.4: Do any four from among: 5, 9, 13, 15, 19, 21, 23 Do either one from among: 25, 27, 29, or 17.
•	10/25	The Midterm Exam
4	11/01	Ch.5: 3, 11, 17 Ch.6: 3, 13, 29, 33, 37, 51, 53
5	11/15	Ch.7: 5, 7, 9, 11, 13, 15, 21, 27, 31, 33
6	11/22	Ch.8: Do any four from among: 7, 9, 11, 13, 15, 19, 21, 23, 25, 27 Term Paper – Rough Draft
7	11/29	Ch.9: Do any four from among: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19
•	12/06	Term Paper The Final Exam

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