

THE
UNIVERSITY of TENNESSEE at CHATTANOOGA 
COLLEGE of BUSINESS

Department of Management

COURSE:	MGT 3760
TITLE:	Simulation Modeling
PREREQUISITES:	MGT 3110
CREDIT:	3 hours
FACULTY:	Dr. Mo Ahmadi
TEXTS:	1. Simulation Modeling Using @RISK: Updated for Version 4, 1st Edition, Wayne L. Winston Indiana University, Kelley School of Business (Emeritus), ISBN-10: 053438059X, ISBN-13: 9780534380595 2. Simulation Using ProModel, 3rd Edition, Charles R. Harrell, ISBN-13 9780073401300

CATALOG DESCRIPTION

Monte Carlo and Discrete-event simulation modeling and analysis of business system. Applications from a variety of business disciplines including marketing, operations, finance, scheduling, and staffing will be discussed. Spring semester. Prerequisites: MGT 3110, junior standing or department head approval. Differential course fee will be assessed.

STUDENT LEARNING OUTCOMES

This is a course in Monte Carlo and Discrete-event simulation for undergraduate students. The course will cover modeling, simulation, analysis of results, and use of simulation software such as ProModel and @Risk. Complete design, analysis, and mostly applications of Monte Carlo and Discrete-event simulation experiments will be emphasized. Applications will be taken mostly from manufacturing, healthcare, and service systems. The course will include the basic concepts of simulation as well as more advanced topics, which will make it possible for the students to simulate various systems and thoroughly understand how simulation can aid in better decision making processes. Topics include stochastic models for simulation, use of analytics for designing simulations and output analysis, and random variable and process generation. Other learning outcomes of the course include:

- Develop competency in mathematical model formulation.
- Use computer technologies for simulating various systems.
- Analyze data and convert data to useful information.
- Use the information to enhance critical thinking.

COURSE CONDUCT

The course will be conducted primarily in a lecture-discussion manner. Students will have access to computers in class. Therefore, in every meeting, students will work on a simulation project. Homework will be required. Students must have their assignments completed before each class meeting. Assignments that are turned in late (no later than one class period) will receive a maximum of 50% of the credit. It is expected that each student will be prepared for each meeting and will agree with the following policies.

1. Read the assigned chapters and textbook material before coming to class.
2. Have the assignments ready to be turned in.
3. Be prepared to complete an in-class assessment in every meeting.
4. There will be no make-up for the missed daily assessments.
5. Missed daily assignments will receive a grade of zero. Assignments that are turned in late (*no later than one class period*) will receive a maximum of 50% of the credit.

GRADING SYSTEM

<u>Grade Item</u>	<u>Points</u>	<u>Final grade</u>
Three exams	300	90% and above = A
HW Assignments	100	80% - 90% = B
Final project	50	70% - 80% = C
Total	450	60% - 70% = D
		Below 60% = F

COMPUTER USAGE

ProModel™ and @Risk computer software will be used for simulation. Also, Excel will be used throughout the course. Students **MUST HAVE THOROUGH KNOWLEDGE OF EXCEL.**

OTHER COMMENTS

- a. During the semester, numerous handouts will be distributed or e-mailed to you via Blackboard. *If you miss a class or cannot download a file, you are responsible for obtaining handouts, assignments and other information from your classmates.*
- b. This is an *elective* upper division course. There will not be any tutor available for this course.
- c. Upon registration, all UTC students become subject to the rules and regulations of the Honor Code (see the Student Handbook).

The Honor Code is fully enforced in my classes.

The Honor Code is based upon the assumption that the student recognizes the fundamental importance of honesty in all dealings within the University community and that education is a cooperative enterprise between student and teacher and between student and student. Any act of dishonesty violates and weakens this relationship and lessens the value of the education that the student is pursuing.

- d. College of Business faculty will be happy to share their knowledge and experience with you as you plan for your future. If you have any questions regarding career paths in this field or interest in applying to graduate school, please feel free to meet with me (or any faculty member).

ADA STATEMENT: Attention: If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Office for Students with Disabilities at 425-4006, come by the office - 102 Frist Hall or see <http://www.utc.edu/OSD/>

If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438 or <http://www.utc.edu/Administration/CounselingAndCareerPlanning/>

SCHEDULE

DATE	ACTIVITY
Week 1	Course Overview – Monte Carlo Simulation using spreadsheet (Chapters 1, 2 and 3)
Week 2	Simulation with @Risk (Chapters 4 and 5)
Week 3	Business applications using @Risk (Selected chapters from 6 to 13)
Week 4	Business applications using @Risk (Selected chapters from 14 to 24)
Week 5	EXAM 1
Week 6	Introduction to discrete event simulation and ProModel (Chapters 1-4 and Labs 1-3)
Week 7	Data collection and Analysis (Chapter 5 and Labs 5)
Week 8	Model building and verification (Chapters 6 and 7, and Labs 4, 6, and 7)
Week 9	Simulation output analysis (Chapter 8 and Lab 8)
Week 10	EXAM 2
Week 11	Comparing systems (Chapter 9 and Lab 9)
Week 12	Simulation optimization (Chapter 10 and Lab 10)
Week 13	Modeling manufacturing systems (Chapters 11 & 12 and Labs 11 & 12)
Week 14	Modeling service systems (Chapter 13 and Lab 13)
Week 15	FINAL EXAM

