BUS 104-001 Decision Analysis and Management Science – Spring 2020

General Information

Instructor Danko Turcic, Associate Professor of Operations Management
Anderson Hall 226
<danko.turcic@ucr.edu>

Office Hours W 2:00-3:30PM (available to Zoom)

Meeting Time TR 12:30-1:50PM

Course Website https://ilearn.ucr.edu

Teaching Assistants

- Dawei Jian <djian005@ucr.edu>
- Mohammad Zolghardr <mzolg001@ucr.edu>
- Zhipeng Chen <zchen176@ucr.edu>

Important Events

Event	Date	Location & Time
Midterm Exam	May 7th	Online (iLearn)
Final Exam	June 6th – 12th	Online (iLearn)

Course Description

The course fosters analytical and quantitative approaches to solving business problems. Many managerial decisions, regardless of their functional orientation, are increasingly based on analysis using quantitative models from the discipline of management science. Management science tools, techniques and concepts (e.g., data, models, and software programs) have dramatically changed the way businesses operate in manufacturing, services, marketing, finance, and other areas.

The primary goal of the course is to help students become effective problem solvers, smart consumers of data, and finally intelligent business decision makers in various management situations. The course utilizes structured problem solving approaches heavily relying on data for defining the problem, uncovering useful relationships between critical variables and outcomes, defining measures for evaluating alternatives, and modeling underlying conceptual relationships with constraining resources. Applications of those analytic tools will be illustrated using examples from various business functional areas: finance, marketing, operations, economics and strategy, etc.

Course Topics

- Decisions under certainty (deterministic math programming)
- Decisions under uncertainty (simulation and decision analysis)

Course Materials

Recommended Text	B. Render, R.M. Stair Jr., and N. Balakrishnan, *Managerial Decision Modeling with Spreadsheets*, 2nd or 3rd edition, Prentice Hall
Lecture Notes	Electronic version of class notes will be periodically posted on iLearn
Additional References	1. Hillier, F. S., and G. J. Lieberman: *Introduction to Operations Research*, McGraw-Hill Publishing Company, any edition 2. Denardo, V.: *The Science of Decision Making: A Problem-Based Approach Using Excel*, Wiley, any edition 3. Ross, S.: *A First Course in Probability*, Prentice Hall, eight edition

Course Requirements and Grading

Component	Weight
Mid-term exam	30%
Final exam	30%
Homeworks	40%

Exams

The best preparation for the exams will be the homework assignments, which I will periodically assign throughout the quarter. Both the midterm and the final exam will be multiple choice.

Homework

Provides opportunity to practice the skills of modeling and analysis introduced in the course. The homework emphasizes quantitative aspects of the course material and provides feedback on how well you have mastered the analytical techniques. The only way to learn Operations Management is to work problems. Homeworks will be assigned weekly and posted in iLearn. Homework submissions will also be handled through iLearn. Late or emailed homework submission will not be graded.

Class Participation

I expect you to read the required materials and be prepared for each class. Asking questions, actively participating in class discussions would be your contribution to the classroom learning. I reserve the right to make random calls to engage you in discussion. Your classroom participation will help me decide your final grade if you are at the borderline.

Academic Integrity

At the University of California, Riverside (UCR) honesty and integrity are fundamental values that guide and inform us as individuals and as a community. The academic culture requires that each student take responsibility for learning and for producing work that reflect their intellectual potential, curiosity, and capability. Students must represent themselves truthfully, claim only work that is their own, acknowledge their use of others' words, research results, and ideas, using the methods accepted by the appropriate academic disciplines and engage honestly in all academic assignments. Misunderstanding of the appropriate academic conduct will not be accepted as an excuse for academic misconduct. If a student is in doubt about appropriate academic conduct in a particular situation, he or she should consult with the instructor in the course to avoid the serious charge of academic misconduct. To ensure the highest standard of academic integrity, all students should be familiar with the guidelines posted at: http://conduct.ucr.edu

Code of Conduct as it Relates to Professional Behavior

Students are expected to conduct themselves at all times in a professional manner. Professional behavior includes, but is not limited to, the following:

1. **Punctuality**: Students are expected to arrive and be seated prior to the start of each class session. They should display their name cards in all classes at all times.
2. **Behavior:** Classroom interaction will be conducted in a spirited manner but always while displaying professional courtesy and personal respect.
3. **Preparation:** Students are expected to complete the readings, case preparations and other assignments prior to each class session and be prepared to actively participate in class discussion.
4. **Distractions**:
   (a) *Exiting and Entering:* Students are expected to remain in the classroom for the duration of the class session unless an urgent need arises or prior arrangements have been made with the professor.
   (b) *Laptop, PDA, and Other Electronic Device Usage:* Students are expected to use laptops and PDAs in classrooms only for activities directly related to the class session.

Course Schedule[1]

[1]Please note that this is an expected course schedule. That is, I reserve the right to make minor changes and updates throughout the semester.

Tuesday	Thursday
Mar 31st **1** **1 Using Computers to Optimize Stuff** **1.1 Problem-Solving Framework** • Introductions • **Reading:** §1 in the textbook, and "Operation everything"	Apr 2nd **2** **1.2 Spreadsheet-Based Modeling and Data Management** • Case Study: "Advertising Budget Decision" • **Reading:** Appendix – Using Excel Commands • **Turn in:** HW 1
7th **3** **2 Using Math Programming to Make Better Decisions** **2.1 Linear Optimization** • Introduction • **Reading:** §2 in the textbook	9th **4** • Formulating linear problems • **Reading:** §§2 and 3 in the textbook • **Turn in:** HW 2
14th **5** • Simplex method: Class examples • **Reading:** §3 (all remaining sections) in the textbook	16th **6** • Case Study: "Red Brand Cannery" (see iLearn) • **Turn in:** HW 3
21st **7** **2.2 Robustness of Math Programming Solutions** • Introduction to sensitivity analysis • **Reading:** §4 in the textbookand lecture slides on iLearn	23rd **8** • Case Study: "Parket Sisters" (see iLearn) • **Turn in:** HW 4
28th **9** **2.3 Discrete linear optimization** • Introduction to integer programming • **Reading:** §5 in the textbook	30th **10** • Discrete optimization (formulation): Class examples • **Reading:** "Early Integer Programming" (see iLearn) • **Turn in:** HW 5
May 5th Midterm Exam Review	7th Midterm Exam

Tuesday	Thursday
12th No Class (D.C. Conference)	14th **11** **2.4 Introduction to nonlinear optimization** Formulating non-linear problems • **Reading:** §5 in the textbook
19th **12** Nonlinear optimization (data, models, and decisions)	21st **13** **3 Decision Making Under Uncertainty** • Introduction to simulation • **Reading:** §9, and Appendix (Probability Concepts and Applications) in the textbook • **Turn in:** HW 6
26th **14** • Simulation applications • **Reading:** §9 in the textbook	28th **15** • Process simulation • **Reading:** "A Better Way to Size up Your Nest Egg" • **Turn in:** HW 7
June 2nd **16** • Simulation applications (hands-on problems in class) • **Case Study:** "Tour Bus Production Process" (see iLearn)	4th **17** **4 Final Exam Review** • **Turn in:** HW 8