Modeling and Operations Research, PPD 557

Tuesdays 6-9:20pm, RGL 100; Course ID: 51221R
Website: www.blackboard.usc.edu
Spring 2017 Course Syllabus

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Importance of this course:

As the dramatic consequences of policy decisions demonstrate the power to generate wealth while at the same time drive successful organizations into bankruptcy, the role of models for understanding the impacts of decision making on outcomes has become increasingly important. Probability and statistics, risk and uncertainty, resource allocation, and other factors influence policy and decision makers. Specifically, the PPD graduate must know how to collect, organize, analyze, and interpret quantitative information in the policy environment.

This course is designed to help students quantify and organize policy information through modeling of relationships among decision making variables.

Course Prerequisite Knowledge

Prior course in probability and statistics; working knowledge of algebra. Familiarity with Microsoft Excel and the Analysis ToolPak add-in. If you are a Mac user you will need to go to http://www.analystsoft.com/en/products/statplusmacle/ for the free ToolPak download.

Course Goal

Students will learn the tools and techniques of quantitative analysis outlined in the schedule, how and when to apply them, and practice application of those tools with homework exercises. Students completing this goal will be prepared to quantify a variety of policy problems for analysis and decision making.

Text

Taylor, Bernard, Introduction to Management Science, 12th Edition, 2016.

Course Description

Chapter 1, Introduction	Introduction to Management Science
Chapter 11, Probability and Statistics	Probability, random variables, methods; discrete and continuous probability models, transformations, linear models
Chapter 12, Decision Analysis	Bayesian decision theory, Multi-attribute decision analysis
Chapter 13, Queuing Theory	Arrival and service time analysis
Chapter 14, Simulation	Modeling of probabilistic relationships
Chapter 15, Forecasting	Prediction models, time series
Chapters 2, 3, 4, Linear Programming	Resource allocation models
Chapter 5, Integer programming	Resource allocation of non-divisible resources (e.g., vehicles)

In general, we will follow the book, but in a different order (see the schedule).

Suggestions (for success)

You should read over the reading assignments before the corresponding lecture.
You should attempt the homework on your own before asking for help.
Make an honest attempt to understand the material before uttering the words, "I don't get this."

Course Requirements and Grades

The course requirements are as follows:

Requirement	Point Total
3 Homework assignments @ 10 points	30
Midterm Exam @ 25 points	25
Mini-Project	20
Final Exam	25
Subtotal	100

The project will be announced after submission of homework assignment 2 and will be graded using the attributes of creativity, relevance, content, organization, and timeliness (4 pts each).

Late papers will be assessed a penalty of 40% per day. All grading issues are closed after 2 weeks from the original due date. Unclaimed papers will be kept 3 weeks before being discarded.

Here is the class schedule.

PPD 557 Spring 2017 Schedule

(Note: homework due in class on date shown)

Date	Topic	Readings	Assignments/Notes
Tuesday Jan 10	Introduction to Management Science	Chapter 1	
Tuesday Jan17	Probability and Statistics: Review	Chapter 11	
Tuesday Jan 24	Probability and Statistics: Applications	Chapter 11	
Tuesday SeJan 31	Decision Analysis-Bayes	Chapter 12	
Tuesday Feb 7	Decision Analysis-Multiattribute Decision Theory	Chapter 12 and notes	
Tuesday Feb 14	Queuing Theory	Chapter 13	Hw 1 due
Tuesday Feb 21	Midterm Review	Chapter 11-13	
Tuesday Feb 28	Midterm		
Tuesday Mar 7	Simulation	Chapter 14	
Tuesday Mar 14	SPRING BREAK		
Tuesday Mar 21	Forecasting	Chapter 15	
Tuesday Mar 28	Linear Programming Intro, Project Requirements	Chapters 2, 3, 4	Hw 2 due
Tuesday Apr 4	Linear Programming	Chapters 3-4	
Tuesday Apr 11	Linear Programming 2	Chapters 3-4	
Tuesday Apr 18	Integer Programming	Chapter 5	
Tuesday Apr 25	Review	Chapter 5; Course overview, final prep	Hw 3 due, Projects due (hard copy)
Tuesday May 9	Final Exam, 7-9 pm		

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. Website and contact information for DSP: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html, (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, (www.usc.edu/scampus or http://scampus.usc.edu) contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/. Information on intellectual property at USC is available at: http://usc.edu/academe/acsen/issues/ipr/index.html.

Emergency Preparedness/Course Continuity in a Crisis

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. Please activate your course in Blackboard with access to the course syllabus. Whether or not you use Blackboard regularly, these preparations will be crucial in an emergency. USC's Blackboard learning management system and support information is available at blackboard.usc.edu.