

Modeling and Operations Research, PPD 557
Tuesdays 6-9:20pm, RGL 100; Course ID: 51221R
Website: www.blackboard.usc.edu
Spring 2018 Course Syllabus

Contents

[Basics](#)
[Importance of this course](#)
[Course Description](#)
[Suggestions for success](#)
[Course Prerequisite](#)
[Course Goal](#)
[Texts](#)
[Course Requirements and Grading](#)
[My Office Hours](#)
[Academic Integrity](#)
[Disability Accommodation](#)
[Emergency Preparedness](#)

Contact Information

Dr. Jeffrey H. Smith

Office Hours: Tuesdays 5-6pm; after class or by appointment

Location: VKC 250; Email: jeffs@usc.edu

Importance of this course:

As the dramatic consequences of analytics on policy decisions demonstrate the power to generate change while at the same time drive successful organizations into obsolescence, the role of models for understanding the impacts of decision making on outcomes has become increasingly important for dealing with complex, interdependent problems. Probability and statistics, risk and uncertainty, resource allocation, and timing have enormous quantitative impact to 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.

Course Goal

Students will learn the tools and techniques of quantitative analytics outlined in the schedule, how and when to apply them, and practice application of the 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 requirements are defined after submission of homework assignment 2. The project is 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 2018 Schedule

(Note: homework due in class on date shown)

Date	Topic	Readings	Assignments/Notes
Tuesday Jan 9	Introduction to Management Science	Chapter 1	
Tuesday Jan 16	Probability and Statistics: Review	Chapter 11	
Tuesday Jan 23	Probability and Statistics: Applications	Chapter 11	
Tuesday Jan 30	Decision Analysis-Bayes	Chapter 12	
Tuesday Feb 6	Decision Analysis-Multiattribute Decision Theory	Chapter 12 and notes	
Tuesday Feb 13	Queuing Theory	Chapter 13	Hw 1 due
Tuesday Feb 20	Midterm Review	Chapter 11-13	
Tuesday Feb 27	Midterm		
Tuesday Mar 6	Simulation	Chapter 14	
Tuesday Mar 13	No Class – Spring Break		
Tuesday Mar 20	Forecasting	Chapter 15	
Tuesday Mar 27	Linear Programming Intro, Project Requirements	Chapters 2, 3, 4	Hw 2 due
Tuesday Apr 3	Linear Programming	Chapters 3-4	
Tuesday Apr 10	Linear Programming 2	Chapters 3-4	
Tuesday Apr 17	Integer Programming	Chapter 5	
Tuesday Apr 24	Review	Chapter 5; Course overview, final prep	Hw 3 due, Projects due (hard copy)
Tuesday May 8	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 is from DSP. Please be sure I receive the letter 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/academicssupport/centerprograms/dsp/home_index.html, (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu.

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu