RUTGERS
UNIVERSITY | CAMDEN
School of Business

Optimization and Spreadsheet Modeling

52:620:321:92
Term: Spring 2023

Instructor: Jinho Kim, Ph.D.
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Online Office Hours via Zoom :
- 10:00am - 11:30am on Tuesday or by Appointment

Office : Distance Learning
Class meetings : Distance Learning

COURSE SPECIFICS

Course Description

This course covers several scientific approaches to solve decision problems from managerial point of view. Students will learn the basic optimization tools and analytic problem-solving skills for decision making in business management. Its main topics include, but not limited to, mathematical and spreadsheet models, optimization programming, sensitivity analysis, and decision-making under uncertainty. Spreadsheets are used extensively to accomplish the mathematical manipulations and to solve optimization problems.

Learning Goals/Objectives

Upon successful completion of this course students should be able to:

1. Develop the ability to apply appropriate quantitative methods to analyze business data, and to apply optimization modeling techniques for decision makings in business management.
2. Understand and explain the modeling process and be able to apply it in a variety of different business situations.
3. Evaluate spreadsheet models by applying good modeling and validation techniques.
4. Implement model-based management solution using Excel Solver.
5. Interpret model results in the context of the busines situation and explain in plain language.

Course Materials

For this course you are required to purchase and register for the **McGraw-Hill Connect** as all assignments and exams will be completed through McGraw-Hill Connect.

- **McGraw-Hill Connect registration includes the eTextbook of Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets (6th edition)** by Frederick S. Hillier and Mark S. Hillier, McGraw-Hill.
- Check Canvas to access how to register the McGraw-Hill Connect.
- You have the option to obtain 14-days for free Trial Access (after that, you must complete the purchase)
- You must have access to Microsoft Excel software that will be used extensively in this course. You should also have the SOLVER button available under the DATA tab in Excel. Please ensure that this SOLVER capability is available as it's used extensively during the course.
- Lecture slides, readings, and other posted material is available on the class Canvas site.

How to succeed in this course

The material presented in class provides the essential backbone of the course. You are expected to:

- Read all text material assigned for each class.
- Follow instructions in all assignments.
- Start assignments early and get feedback from the instructor.
- Consult/meet with the professor immediately when you need help.
- If an online tool is used (Canvas and McGraw-Hill Connect) ensure that you can access and use it appropriately.
- Participate in the assigned class discussions, whenever you can, to get maximum credit for class participation. These discussions are designed to be a collaborative learning experience for all involved.
- For the general class discussion forum, you are also strongly encouraged to share any relevant class related topics pertaining to current business environment. You may also benefit and assist other students via thoughtful interaction.
- **Direct Interaction:** Although Canvas provides good learning tools, oftentimes, a direct one-to-one professional interaction to resolve difficult issues is usually the most effective. For example, you may have a certain technical/mathematical problem that is frustratingly difficult to solve that you think is difficult be resolved in an open forum or elsewhere. In this case, please feel free to send me an e-mail.

Diversity Statement:

This class strives to be an inclusive community, learning from the many perspectives that come from having differing backgrounds and beliefs. As a community, we aim to be respectful to all. We reject all forms of prejudice and discrimination, including but not limited to those based on age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, and veteran status. Faculty and students are expected to commit to creating an environment that facilitates inquiry and self-expression, while also demonstrating diligence in understanding how others' viewpoints may be different from their own.

Our goal as a learning community is to create a safe environment that fosters open and honest dialogue. We are all expected to contribute to creating a respectful, welcoming, and inclusive environment. To this end, classroom discussions should always be conducted in a way that shows honor, respect, and dignity to all members of the class. Moreover, disagreements should be pursued without personal attack and aggression, and instead, should be handled with grace and care. This will allow for rigorous intellectual engagement and a deeper learning experience for all.

COMMUNICATION

Class Materials:

All class materials can be obtained via Canvas. Note that the PowerPoint class materials for a particular week will be posted by noon on Monday, usually one week ahead of schedule (except for the first week or two.) You are strongly encouraged to access this course via Canvas several times a week.

Class Communication:

Since class attendance is not compulsory, a viable and reliable form of communication is vitally important. Note that all class communication will be via your Rutgers e-mail and discussion forums and other tools in Canvas. You are expected to check your Rutgers e-mail at least two or three times every week. All class announcements can also be accessed via the 'Announcement' page in Canvas. **Not checking your Rutgers email is not an excuse for missing any communications.**

Professor Communication:

Note that during the week, from Monday until Friday, I will try reply to all e-mails within 24 hours. Please do not expect immediate response. (If you do not hear from me within 48 hours, please re-send your email as I may have overlooked or accidentally deleted your e-mail.)

Although, I check my e-mails a few times daily, I may not be able to completely answer all e-mails immediately upon receiving them. Note that I may also be travelling out of town on many weekends and may not be able respond to weekend e-mails until Monday.

GENERAL /ADMINISTRATIVE

Key Spring 2023 Dates

Spring 2023 classes begin	Tuesday, January 17th
Last day to drop classes w/o "W"	Thursday, January 26th
Last day to add classes	Thursday, January 26th
Last day to withdraw from an individual class with a "W"	Monday, April 3rd
Spring recess	Saturday, March 11th – Sunday, March 19th
Regular classes end	Monday, May 1st
Reading day	Tuesday, May 2nd and Wednesday, May 3rd
Final exam period	Thursday, May 4th – Wednesday, May 10th

Disability Services/Accommodations

The University is committed to supporting the learning of all students and faculty will provide accommodations as indicated in a Letter of Accommodation issued by the Office of Disability Services (ODS). If you have already registered with ODS and have your letter of accommodations, please share this with me early in the course. If you have or think you have a disability (learning, sensory, physical, chronic health, mental health or attentional), please contact https://success.camden.rutgers.edu/disability-services.

Accommodations will be provided only for students with a letter of accommodation from ODS. Their services are free and confidential. Letters only provide information about the accommodation, not about the disability or diagnosis.

Academic Integrity

The Academic Integrity policy can be found at http://studentconduct.rutgers.edu/student-conduct-processes/academic-integrity/

Students are responsible for understanding the principles of academic integrity and abiding by them in all aspects of their work at the University. Students are also encouraged to help educate fellow students about academic integrity and to bring all alleged violations of academic integrity they encounter to the attention of the appropriate authorities.

Academic Integrity means that you (the student) must:

- properly acknowledge and cite all use of the ideas, results, or words of others,
- properly acknowledge all contributors to a given piece of work,
- make sure that all work submitted as your own in a course activity is your own and not from someone else
- obtain all data or results by ethical means and report them accurately
- treat all other students fairly with no encouragement of academic dishonesty

Adherence to these principles is necessary in order to ensure that:

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments
- all student work is fairly evaluated and no student has an inappropriate advantage over others
- the academic and ethical development of all students is fostered

•the reputation of the University for integrity is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld. Violations are taken seriously and will be handled according to University policy.

Student Code of Conduct

Rutgers University-Camden seeks a community that is free from violence, threats, and intimidation; is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and does not threaten the physical or mental health or safety of members of the University community, including in classroom space.

As a student at the University you are expected adhere to the Code of Student Conduct.

To review the code, go to the Office of Community Standards:
https://deanofstudents.camden.rutgers.edu/student-conduct

Note that the conduct code specifically addresses disruptive classroom conduct, which means *"engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."*

EXPECTATIONS OF CLASSROOM CIVILITY

(source: the Assoc of College and University Educators)

The following protocols on the codes of behavior reflect professional business norms on manners, courtesy, and respect. (***In general, you should treat others as you would like others to treat yourself. Be mindful that what is acceptable in a text or chatroom with friends may not be appropriate in a classroom or in an online conversation with an instructor***.)

- You are expected to do your own work. Cheating, plagiarism, and any other form of academic dishonesty will not be tolerated and will result in (include consequences).
- Meaningful and constructive dialogue is encouraged in this class and requires a willingness to listen, tolerance for different points of view, and mutual respect from all participants. All course members will be expected to show respect for individual differences and viewpoints at all times.
- The use of electronic devices can be disruptive to those around you. As a result, the use of such devices should be limited to class-related tasks.

CLASSROOM POLICIES

Exam Make-up Policy/Late Policy

If, for a university approved reason, you cannot take an exam at the scheduled time you must give the professor written **notice at least one week in advance** so that other arrangements can be made. If the situation does not allow for advance notification (for example, emergency hospitalization), contact the professor as soon as possible after a missed exam. Make-up exams and quizzes for non-university approved reasons are not guaranteed. The professor reserves the right to request written documentation to support your absence (such as a doctor's note, an obituary, or military orders).

Assessments

ASSIGNMENTS: All assignments except reading assignments have one-week grace period with 20% penalty, meaning you do not need to ask for permission to submit a week late. After one-week grace period, you will get zero grade without prior notification and a physician's excuse.

If you need help with any assignments, please email me or visit my online office hours.

EXAM/QUIZ: The exams and the Quizzes will be provided via **McGraw-Hill Connect**. Students are reminded to adhere to the university's academic integrity policy. Any violations to academic integrity policy may result in receiving a failure for the course.
Exam and Quiz Policy: No makeup exams and quizzes will be scheduled without prior notification and a physician's excuse.

CLASS PARTICIPATION: It is expected that you will (1) visit Canvas homepage regularly every week, (2) watch lecture videos and study course materials attentively, and (3) contribute often to class discussions. Your in-class comments should be thoughtful and should reflect your careful reading of the assigned course material.

Participation and Late Work Policy: lack of participation will be reflected in the final grade. All assignments must be handed in on time; **late work will receive reduced or no credit**.

Incompletes and Problems Policy: If you find that you are having trouble completing course work or need further explanation of class topics, please schedule an appointment with me immediately. If you need this class for graduation, you should be sure that your performance is up to standard throughout the course. It is too late to wait until the last week of classes to ask for help. I'm available to meet throughout the entire semester if you need help. "Incompletes" will only be given through prior consultation, under extreme circumstances.

DISCUSSION BOARD ACTIVITY: There will be specific discussion board activities in this course. Discussions may involve any combination of prepared materials, journal articles, textbook readings, mini-cases, problems, videos, or other resources. All postings including responses are to be substantive and further the discussion of the topic of interest. Postings on the discussion board must reflect student's reading and comprehension of the assigned readings and/or related discussion activity. Discussion postings must reflect the ability to synthesize concepts presented through writing at a college level. **The minimum length of a post is 100 words not including references listed.** A typical rubric for evaluating discussion board activity will be provided. In addition to these specific assigned discussions, there will be also be a general class forum for discussing issues related to the class, but these will not be graded.

GRADING

The assignment of final grades, the course requirements will be weighted approximately as follows:

Midterm Exam 1 .....20%
Midterm Exam 2 .....20%
Final Exam 30%
Assignment.....25%
Discussion Board Activity.....5%

Grade Ranges

Letter Grade Description
A Highest grade (89.5% and above)
B+ Work of distinction (84.5% to 89.4%)
B Work of distinction (79.5% to 84.4%)
C+ Average work (74.5% to 79.4%)
C Average work (69.5% to 74.4%)
D Passing, but unsatisfactory (60% to 69.4%)
F Failure without credit (Below 60%)

COURSE OUTLINE AND ASSIGNMENTS

Listed below are the **tentative** topics to be covered each week. Note that these topics may be subject to change and any changes in topics will be announced via Announcement in Canvas.

Week	Topics	Chapter Readings	Learning Events
Week 1. Jan. 17 - 23	Introduction and Course Overview	Chapter 1	McGraw-Hill Connect Registration Introduce yourself.
Week 2. Jan. 24 - 30	Linear Programming: Maximization	Chapter 2	- Complete Chapter 1 Assignment
Week 3. Jan. 31 -Feb. 6	Linear Programming: Minimization	Chapter 2	- Complete Chapter 2 Assignment
Week 4. Feb. 7 – 13	Linear Programming: Formulation and Applications	Chapter 3	
Week 5. Feb.14 - 20	Linear Programming: Formulation and Applications	Chapter 3	- Complete Chapter 3 Assignment
Week 6. Feb. 21 – 27	**Midterm Exam 1**		Chapters 1, 2, 3
Week 7. Feb. 28 – Mar.6	What-if analysis for Linear Programming	Chapter 5	- Complete Chapter 5 Assignment
Week 8. Mar. 7 - 13	Network Optimization Problems	Chapter 6	
Week 9. Mar. 14 - 20	**Spring Recess (No Class)**		
Week 10. Mar. 21 – 27	Network Optimization Problems	Chapter 6	- Complete Chapter 6 Assignment
Week 11. Mar. 28-Apr. 3	**Midterm Exam 2**		Chapters 5, 6
Week 12. Apr. 4 - 10	Using Binary Integer Programming	Chapter 7	
Week 13. Apr. 11 - 17	Using Binary Integer Programming	Chapter 7	- Complete Chapter 7 Assignment
Week 14. Apr. 18 - 24	Decision Analysis	Chapter 9	
Week 15. Apr. 25-May 1	Decision Analysis	Chapter 9	- Complete Chapter 9 Assignment
Week 16. May 2 - 8	**Final Exam**	TBA	