RUTGERS
School of Business | Camden

Optimization and Spreadsheet Modeling

Course: 52:620:321:03: Spring 2025

Instructor: Michael T. Dominik, Ph.D.
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Class meeting: Tue/Thu 935am-1055am, CCR-NCR
Office Hours: Upon request via email

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 spread- sheet models, optimization programming, sensitivity analysis, and decision-making under uncertainty. Spreadsheets are used extensively to accomplish mathematical manipulations and to solve optimization problems.

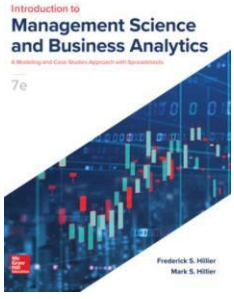
Learning Goals/Objectives

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 making 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 business situation and explain in plain language.
6. Communicate complex ideas effectively and accurately in a range of contexts.
7. Demonstrate the ability to identify and weigh the ethical implications of actions taken by organizations and stakeholders.

Textbook: Introduction to Management Science and Business Analytics (7th edition) by Frederick S. Hillier and Mark S. Hillier, McGraw-Hill. ISBN13:9781260719277, digital with Connect. *Do not buy paper copy or just eBook. Get Connect too.*

1. For this course you are **required to purchase and register for the McGraw-Hill Connect** as 91% of your graded work will be completed through McGraw-Hill Connect.
2. Check Canvas to access how to register with McGraw-Hill Connect.
3. You have the option to obtain 14-days for free Trial Access (after that, you must complete the purchase)
4. You must have access to Microsoft Excel software that will be used extensively in this course.



How to succeed in this course

1. You will need to purchase a full account for this course on McGraw-Hill Connect. This includes the eBook for this course, and 80% of your graded work will be done using Connect. DO NOT DELAY purchasing this account. DO NOT complain to the Professor if you cannot access the coursework because you did not purchase Connect. For instructions on getting this account, see on our course Canvas the module "Using McGraw-Hill Connect". If you have any problems with McGraw-Hill Connect, contact their excellent Help Desk team at 1-800-331-5094.
2. Allow time in your life for this course. You should dedicate time to reading, watching videos, and practicing the material. There are 31 individual assignments in this course, and also three tests = total of 34 work items. Each of these assignments is time-consuming and will require your attention. You should plan on allowing at least 2-3 hours each week to do the assigned work at a time of your choosing. Use the Canvas calendar to remind yourself when work is due and commit yourself to good time management to complete the coursework.
3. Attend class. The Professor will review many Excel techniques that you can best learn by watching them performed in class, and then trying them yourself in class, when you can then ask for specific help. If you miss these classes and then don't understand how to use Excel to solve problems, there is no opportunity to make up the session. Also, there will be some in-class activities and exercises that will be done to inform some Discussion threads and Field Study assignments, and if you miss them, you may have even more difficult work to do as an alternative. Some classes that are organized around Team assignments may be conducted using Zoom; Professor will advise beforehand.
4. Book time in your schedule for the Tests. There are three Tests each assigned for a specific date, see the syllabus for the date of the three tests. These tests are online in Connect, and you can do them remotely or in the Rutgers classroom. You will have the full 24 hours of this date to complete the test, but you MUST complete it on this date unless you provide some University-approved or other written reason as to why you may need a different date. Put these dates in your personal schedule and be sure you are available – don't tell me later, "I forgot there was a Test". Schedule it now.
5. Be sure you have a working copy of Microsoft Excel 2016 or newer. All Rutgers students are provided Excel as part of their Microsoft Office 365. See getoffice.rutgers.edu for more details.
6. Be sure you have a basic working knowledge of Microsoft Excel. If you struggle with Excel, there is online help available. In Canvas, a specific module has been created called, "Using Microsoft Excel", which points to several good resources available via LinkedIn Learning. There are even some Chapter 1 quiz questions assigned to be sure you have attempted to view some of this online Excel learning.
7. Complete all Smart Book work by the assigned due date. Smart Book assignments are your way of reading the textbook. Due dates are very specific. See additional notes in this syllabus under "Assessments" about why this is important. Take this seriously.
8. Complete the Discussion questions on time and follow the instructions for each.
9. Complete the Field Study assignments on time. These are specific and build upon one another. You cannot avoid doing these assignments and then try to catch up at the end of the semester. The Professor reserves the right to assign you any grade, including zero, for late submissions of these assignments.
10. If you are struggling, reach out for help. Although we will review topics in class, a direct one-to- one professional interaction with the Professor to resolve difficult issues can

sometimes be an effective means to truly understand. In this case, please feel free to send me an e-mail (michael.dominik@rutgers.edu) and propose a day and time during my office hours (see top of the syllabus) for us to confer.

COMMUNICATION

Canvas

Posted will be the syllabus, resources (articles and examples), PowerPoint slides, announcements, guides, etc. To access this system, go to http://canvas.rutgers.edu log in, and click on the course on the dashboard.

Rutgers email - USE YOUR RUTGERS EMAIL ADDRESS

All communications to students will be done using the Rutgers email address provided to you. Please forward your Rutgers email to your personal email if necessary. Not checking your Rutgers email is not an excuse for missing any communications.

Class Materials:

All class materials can be obtained on Canvas and McGraw-Hill Connect. You are strongly encouraged to schedule at least three hours each week in Canvas and Connect.

Professor Communication to Students:

Since class attendance is not compulsory, a viable and reliable form of communication is vitally important. Note that I will communicate to you via your Rutgers e-mail, typically using the Canvas email feature. You are strongly advised to check your Rutgers e-mail at least three times each week to be aware of important communications.

Student Communication to the Professor:

Note that during the week, from Monday until Friday, I will try reply to all e-mails within 24 hours. Please do not expect an immediate response on the same day. If you do not hear from me within 48 hours, please re-send your email. Although I check my e-mail 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

Important Dates for Spring 2025

REGISTRATION ACTION	DAY AND DATE
Diploma Application Period for May Graduation	Tuesday, January 2 - Friday, March 1
Martin Luther King, Jr. Day—All University Offices Closed—No Classes	Monday, January 20
Spring Semester Begins	Tuesday, January 21
Spring Recess—University Offices Open—No Classes	Saturday, March 15 - Sunday, March 23
Regular Classes End	Monday, May 5
Reading Days	Tuesday and Wednesday, May 6 & 7

Final Exam Period	Thursday, May 8 - Wednesday, May 14

Assessment: How you will be graded.

Tests: These assignments are intended to showcase your ability to complete quantitative modeling questions. Three tests are assigned in McGraw-Hill Connect but different than the quizzes, they are based on the Professor's questions and lectures. Tests should be completed independently and in accordance with the University's academic integrity policy. Any violations to academic integrity policy may result in receiving a failure for the course. No makeup tests will be scheduled without prior notification and/or a physician's note. Tests have an option to be taken twice, for which the second attempt is an entire re-work of all questions, and second attempts will also have an automatic assigned penalty of 5%, so the highest grade you can earn is 95%.

Connect Smart Book reading: Connect Smart Book assignments are your way of reading the textbook and is graded. All Smart Book reading assignments are assigned in McGraw-Hill Connect and **should be completed by the due date**. McGraw-Hill Connect does not allow for Smart Book work to automatically be given credit after the due date. You can complete the assignment after the due date, but credit will NOT be automatically given. During the last week of the semester, the Professor will change the due dates for all Smart Book assignments, after which – if you want credit - you can go back in and manually open each Smart Book assignment and either complete it then or, if you have already completed it, then you can open and quickly leave the assignment, and credit will be given. Therefore, if you complete it late, do not ask me, "Why am I not being given credit for Smart Book?", rather, you will need to wait until the end of the semester to get credit. I strongly recommend you complete these items on time.

Quizzes: These assignments are designed to assess your understanding of chapter course concepts, but without the time or grade pressure of a Test. All quizzes are assigned in McGraw-Hill Connect and should be completed independently and in accordance with the University's academic integrity policy. Any violations to academic integrity policy may result in receiving a failure for the course. Quizzes have an option to be taken twice, and the second attempt is an entire re-work of all questions. There is no penalty for taking a quiz twice.

Field Studies and Activities. These assignments are intended to enhance your practical knowledge of the application of optimization modeling methods. These may include work done during class time, which may be synchronous and remote. You may be assigned into teams to complete some of this work, which may include teamwork, research, investigations,

observations, data collection, interviews, inquiries, and other forms of learning by doing. If you miss class during some of the field studies and activities, you may be offered an alternative assignment that may require more time than actually having done the work in class. These posts must be completed on time, and late posts may be reduced in grade or may not be accepted at all and may result in a zero grade.

Discussion Board posts. These assignments are intended to promote your understanding of the practical application of modeling. 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. Discussion postings must reflect the ability to synthesize concepts presented through writing at a college level. As appropriate, a rubric for evaluating the discussion board post will be provided.

Attendance. Attendance will be taken by the Professor for each class meeting, including Zoom meetings, and will be compiled at the end of the semester to determine its impact on your grade. You are allowed a maximum of five absences for the entire semester. Each additional absence after five will each result in the loss of 3% of your total course grade. It is your responsibility to keep track of your absences; the Professor will not advise how many class meetings you have missed unless you request it. Appeals for exceptions such as for University-approved reasons may be made via email directly to the Professor and should include rationale and documentation.

Grading Allocations

The assignment of final grades will be weighted cumulatively as follows:
Tests (3, equally weighted)..... 40%
Connect Smart Book (there are 7)..... 21%
Connect Quizzes (there are 7)..... 10.5%
Field Studies and Activities (there are 10)..... 11.1%
Discussion Board Posts (there 7) 8.4%
Attendance (see Attendance description).....9%

Grade Ranges

Letter Grade Description
90-100 = A (4.0)
85-89 = B+ (3.5)
80-84 = B (3.0)
75-79 = C+ (2.5)
70-74 = C (2.0)
60-69 = D (1.0)
59 or below = F (0.0)

COURSE OUTLINE AND ASSIGNMENTS

Listed below are the **tentative** topics to be covered each week. Note that these topics may besubject to change and any changes in topics will be announced via email through Canvas. * are tentatively planned Field Study dates.

Class Week	Topics	Chapter	Learning Events

1	Introduction to Management Science	Chapter 1	- Complete Chapter 1 SmartBook, Discussion post, and Quiz
2	Linear Programming: Basic Concepts	Chapter 2	- Complete Chapter 2 SmartBook, Discussion post, and Quiz. Field Study 1.
3	Linear Programming: Basic Concepts	Chapter 2, 6	- Complete Chapter 2 SmartBook, Discussion post, and Quiz. Field Study and Activity.
4	Linear Programming: Formulation and Applications	Chapter 6	- Complete Chapter 6 SmartBook, Discussion post, and Quiz. Field Study 2.
5	Linear Programming: Formulation and Applications	Chapter 6	- Complete Chapter 6 SmartBook, Discussion post, and Quiz. Field Study 2.
	Test 1 – date see Canvas		Chapters 1, 2, 3
6	What-if analysis for Linear Programming	Chapter 5	- Complete Chapter 5 SmartBook, Discussion post, and Quiz
7	What-if analysis for Linear Programming	Chapter 5,9	- Complete Chapter 5 SmartBook, Discussion post, and Quiz. Field Study and Activity.
8	Network Optimization Problems	Chapter 9	- Complete Chapter 9 SmartBook, Discussion post, and Quiz. Field Study and Activity.
9	Network Optimization Problems	Chapter 9	- Complete Chapter 9 SmartBook, Discussion post, and Quiz. Field Study and Activity.
	Test 2 – date see Canvas		Chapters 5, 9
10	Queuing Models	Chapter 13	- Complete Chapter 13 SmartBook, Discussion post, and Quiz
11	Queuing Models	Chapter 13	- Complete Chapter 13 SmartBook, Discussion post, and Quiz
12	Queuing Models, Predictive Analytics Forecasting	Chapter 13, 4	- Complete Chapter 13 SmartBook, Discussion post, and Quiz. Field Study and Activity.
13	Predictive Analytics Forecasting	Chapter 4	- Complete Chapter 4 SmartBook, Discussion post, and Quiz. Field Study and Activity.
14	Predictive Analytics Forecasting	Chapter 4	- Complete Chapter 4 SmartBook, Discussion post, and Quiz. Field Study and Activity.
	Test 3 – Final Exam – per University dates		Chapters 4, 13

Course Policies

Test Make-up Policy: If, for any reason, you cannot take a Test on the scheduled date 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 test. Make-up Tests are not guaranteed. The professor reserves the right to request written documentation to support your missed Test (such as a doctor's note, an obituary, or military orders).

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. Ifyou 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 am available to confer with you throughout the entire semester if you need help. "Incompletes" will only be given throughprior consultation, under extreme circumstances.

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.

Code of Student 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.*