

Quantitative Models for Decision Makers

MASY1-GC 1210 | 200 | Fall 2023 | 01/23/2024 - 04/30/2024 | 3 Credit

Modality: Online (Sy)

Course Site: <https://brightspace.nyu.edu/>

General Course Information

Name/Title: Andreas D. Christopoulos, Ph.D., Adjunct Professor, He/Him/His

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Class Meeting Schedule: 01/23/2024 - 04/30/2024 | Tuesday | 07:00pm -- 09:35pm

Class Location: Online (Sy)

Office Hours: After class only

Description

This course prepares students to analyze operational and strategic business situations and select appropriate and optimal courses of action. Using quantitative tools, students learn to analyze the firm's operation, employ sound critical decision making to initiate appropriate action and move the organization to creative problem solving. This course provides students with the tools and techniques required to manage these processes efficiently and make decisions effectively.

Prerequisites

N/A

Learning Outcomes

At the conclusion of this course, students will be able to:

- Apply appropriate mathematical concepts and computational methods in economics, operations research, logistics, and business planning
- Design, business case solutions using probability theory, numerical computations, and quantitative methods
- Apply skills and knowledge of advanced analytical methods and tools to facilitate decision making
- Analyze business problems using linear programming and network flow management for decision making

Communication Methods

Be sure to turn on your [NYU Brightspace notifications](#) and frequently check the "Announcements" section of the course site. This will be the primary method I use to communicate information critical to your success in the course.

Structure | Method | Modality

There are 14 sessions in this course. The sessions follow the textbook and material closely and are divided into broadly three parts: (i.) Foundations of optimization and LP (chapters 1, 2 and 3); (ii.) Expansion of optimization and planning (chapters 6 and 9); and (iii.) Advanced topics in decision-making (chapter 11, 12 and 13).

Active learning experiences and small group projects are key components of the course. Assignments, papers, and exams will be based on course materials (e.g., readings, videos), lectures, and class discussions. Course sessions will be conducted synchronously on NYU Zoom, which you can access from the course site in [NYU Brightspace](#). If you have problems accessing Zoom, and/or recorded Zoom sessions contact NYU IT; I have no control over access.

Expectations

Learning Environment

You play an important role in creating and sustaining an intellectually rigorous and inclusive classroom culture. Respectful engagement, diverse thinking, and our lived experiences are central to this course, and enrich our learning community.

Participation

You are integral to the learning experience in this class. Be prepared to actively contribute to class activities, group discussions, and work outside of class.

Assignments and Deadlines

Please submit all assignments to the appropriate section of the course site in [NYU Brightspace](#). If you require assistance, please contact me BEFORE the due date.

Class	<u>Assign Date</u> <u>Scope</u>	<u>Due Date</u>
1	1/23/2024 HW1: Intro, Basic Solver, Appendix A, Excel Functions, Chp. 1	1/30/2024
2	1/30/2024 HW2: Chp. 2 Linear Programming; Rev HW1	2/6/2024
3	2/6/2024 HW3: Chp. 3 Analytics; Rev HW2	2/13/2024
4	2/13/2024 HW4: Chp. 6 Beginning of Network Flow; Rev HW3	2/20/2024
5	2/20/2024 HW5: Chp. 6 Finish Network Flow; Rev HW4	2/27/2024
6	2/27/2024 Rev HW5; Pointers on Midterm; Start Chap 9	NA
7	3/5/2024 Timed Midterm Exam	3/5/2024
8	3/12/2024 HW6: Review of Midterm; Finish Chp. 9 Project Planning	3/26/2024
	3/19/2024 Spring Break No Class	NA
9	3/26/2024 HW7: Chp.11, Queuing; Rev HW6	4/2/2024
10	4/2/2024 HW8: Chp.13 Decision Making Techniques; Rev HW7	4/9/2024
11	4/9/2024 HW9: Chp.12 Beginning of simulation; Rev HW8	4/16/2024
12	4/16/2024 HW10: Chp.12 End of simulation; Rev HW9	4/23/2024
13	4/23/2024 Advanced Simulation presentation; Rev HW10	NA
14	4/30/2024 Timed Final Exam	4/30/2024

Course Technology Use

We will utilize multiple technologies to achieve the course goals. I expect you to use technology in ways that enhance the learning environment for all students.

We will utilize multiple technologies to achieve the course goals. These include Excel and online LP technologies. I expect you to use technology in ways that enhance the learning environment for all students. All class sessions require use of Zoom. All class sessions require

use of technology (e.g., laptop, computer lab) for learning purposes.

Feedback and Viewing Grades

I will provide timely meaningful feedback on all your work via our course site in NYU Brightspace. You can access your grades on the course site Gradebook.

Attendance

I expect you to attend all class sessions. Attendance will be taken into consideration when determining your final grade.

Refer to the [SPS Policies and Procedures](#) page for additional information about attendance.

Students are expected to attend all on-line class sessions. Excused absences are granted in cases of documented serious illness, family emergency, religious observance, or civic obligation. In the case of religious observance or civic obligation, this should be reported in advance. Unexcused absences from sessions may have a negative impact on a student's final grade. Students are responsible for assignments given during any absence.

If for some reason (excused absence) you will not be in class, you must notify the instructor prior to the scheduled session if you will not be attending and the reason.

Each unexcused absence or being late may result in a student's grade being lowered by a fraction of a grade. A student who has three unexcused absences may earn a Fail grade.

Textbooks and Course Materials

Book: An Introduction to Management Science: Quantitative Approaches to Decision Making, by Jeffrey D. Camm, James J. Cochran, Michael J. Fry, Jeffrey W. Ohlmann, David R. Anderson, Dennis J. Sweeney, Thomas A. Williams 16th Edition | Copyright 2023. You may purchase the hardcopy or the eBook with ISBN-13: 9780357715581. The eBook is recommended and costs about \$50. I will be using questions and readings from the 16th Edition. There are various ways to get the 16th Edition for the text. If you subscribe to multibook licensing with Cengage, you may find it among the choices. Alternatively, you may check licensing for the eBook for the 16th edition at Amazon, or even at

Google Books at the following link:

https://www.google.com/books/edition/An_Introduction_to_Management_Science/Qu/kVRhEAAQBAJ?hl=en&gbpv=0

- **Microsoft Excel:** You must use Microsoft Excel and not a free similar spreadsheet program as for example found on Google (Google Sheets). We will refer to Excel and will expect you to develop your own spreadsheets. Typically, we will go through some development exercises in the second half of the class, as necessary. All homework will include some **heavy** spreadsheet implementation and so **you** will have to do a substantial amount of work in this area. From time to time, I may share my spreadsheets but am not required to do so and this is completely at my discretion. We will review all assignments question by question. You should anticipate that all the Excel programming will be your responsibility. You need to have Excel with Solver installed

before Class 1. Sometimes this presents a challenge for Mac users, and you need to sort that out on your own prior to class. You will also need to have a reliable internet connection and a headset with microphone capability. I will provide presentation materials sometimes before and sometimes after class at my discretion.

- A reliable headset that can be muted. A good internet connection.

Grading | Assessment

The material and assessment methods are well established and effective. The table below summarizes how grades are calculated in this course. No late assignments will be accepted, and assignments not turned in will receive a grade of zero (0).

DESCRIPTION	PERCENTAGE
Assigned Activities (total of 10 at 5% each)	50%
Participation	5%
Midterm Examination (timed)	20%
Final Examination (timed)	25%
<hr/> TOTAL POSSIBLE	<hr/> 100%

Coursework will consist of 10 homework assignments (50% of grade); a Timed Midterm Exam (20%) during one class period and a Take-Home Final Exam (25%) made available after the last class period. Additionally, evaluation of your class participation is at my discretion based upon questions that I may ask of you individually in a cold calling format (5% of grade). As all lectures are recorded, it is not possible for me to not have your responses recorded and you need to know that is simply a fact of the online format.

The content of the HW is from the book, presentations, case studies, and lectures in keeping with each chapter. In all HWs heavy Excel modeling is used and in most cases Solver. There is basic function utilization with cell formula expressions that include SUMPRODUCT, SUM, AND, OR, IF, XLOOKUP functions which will be reviewed, as necessary. HWs are graded principally on effort and where appropriate we review questions in class. I will not grade question by question, but I will provide solutions either in class or in written form. Little if any partial credit will be given for incorrect answers on the Midterm Exam and Final Exam.

The Final Exam is cumulative to ensure that what is learned through the course is digested and demonstrated by the end. However, emphasis will be placed on the last 3 chapters covered. Exam question answers are not provided to students.

- 10 Homework (50%, 5% each): The aim of assigned homework is to help students master the concepts and calculations covered in class intensely every week. No late homework is accepted.
- Timed Midterm Exam (20%): The Timed Midterm Exam will be made available online during the regularly scheduled class period for the 6th class meeting and is worth 20%. A late turn in on the Midterm Exam will result in an automatic grade for the Midterm Exam of 0%. There are no makeups. It will be due by 10:00pm on the day it is assigned.

- **Timed Final Exam (25%):** The Timed Final Exam will be made available during the regularly scheduled class period on the 14th class meeting and is worth 25%. It will be due by 10:00pm on the day it is assigned as grades for the course are due within 72 hours of the last class. A late turn in on the Final Exam will result in an automatic grade for the Final Exam of 0%. There are no makeups.
- **Class Participation (5%)**

See the [“Grades” section of Academic Policies](#) for the complete grading policy, including the letter grade conversion, and the criteria for a grade of incomplete, taking a course on a pass/fail basis, and withdrawing from a course.

Course Outline

Start/End Dates: 01/23/2024 - 04/30/2024 | Tuesday

Time: 07:00pm -- 09:35pm

No Class Date(s): Tuesday, 03/19/2024

Special Notes: Spring Break 03/18/24 - 03/24/24

Session 1 - 01/23/24 As of Tuesday, January 23, 2024 you should have read Appendix A and Chap 1 and we will cover Appendix A and Chap 1 and Solver Use, Basic Excel Functions, some Basic Algebra, and Summation notation, and use of web applications. HW1 is assigned.

Session 2 – 01/30/24 As of Tuesday, January 30, 2024 you should have read Chap 2 and we will cover that material. we will review HW1. HW2 is assigned

Session 3, 02/06/24 As of Tuesday, February 6, 2024 you should have read Chap 3 and we will cover that material and we will review HW2. HW3 is assigned.

Session 4, 02/13/24 As of Tuesday, February 13, 2024 you should have started Chap 6 and we will cover that material and we will review HW3. HW4 is assigned.

Session 5, 02/20/24 As of Tuesday, February 20, 2024 you should have completed Chap 6 and we will cover that material and we will review HW4. HW5 is assigned

Session 6, 02/27/24 As of Tuesday, February 27, 2024 you should have you should have started Chap 9 and we will review HW5.

Session 7, 03/05/24 As of Tuesday, March 5, 2024 you should have completed all readings and HWs through Chapter 6. The Timed Midterm Exam begins online, in-class at 7:00pm and is due today online at 10:00pm.

Session 8, 03/12/24 As of Tuesday, March 12, 2024 you should have completed Chap 9 and we will review the Midterm Exam. HW6 is assigned.

Session 9, 03/26/24 As of Tuesday, March 26, 2024 you should have completed Chap 11 and we will cover that material and we will review HW6. HW7 is assigned.

Session 10, 04/02/24 As of Tuesday, April 2, 2024 you should have completed Chap 13 and we will cover that material and we will review HW7. HW8 is assigned.

Session 11, 04/09/24 As of Tuesday, April 9, 2024 we will start Chap 12 and we will cover that material and we will review HW8. HW9 is assigned.

Session 12, 04/16/24 As of Tuesday, April 16, 2024 we will finish Chap 12 and we will cover that material and we will review HW9. HW10 is assigned.

Session 13, 04/23/24 As of Tuesday, April 23, 2024 we will review HW10, and I will provide some pointers pertaining to the Final Exam and discussion of Advanced topics.

Session 14, 04/30/24 As of Tuesday, April 30, 2024 you should have completed all the readings and homework for the course to date and prepared for the Timed Final Exam the Timed Final Exam will be made available online, in-class at 7:00pm and is due today online at 10:00pm.

NOTES:

The syllabus may be modified to better meet the needs of students and to achieve the learning outcomes.

The School of Professional Studies (SPS) and its faculty celebrate and are committed to inclusion, diversity, belonging, equity, and accessibility (IDBEA), and seek to embody the IDBEA values. The School of Professional Studies (SPS), its faculty, staff, and students are committed to creating a mutually respectful and safe environment (*from the [SPS IDBEA Committee](#)*).

New York University School of Professional Studies Policies

1. **Policies** - You are responsible for reading, understanding, and complying with [University Policies and Guidelines](#), [NYU SPS Policies and Procedures](#), and [Student Affairs and Reporting](#).
2. **Learning/Academic Accommodations** - New York University is committed to providing equal educational opportunity and participation for students who disclose their dis/ability to the [Moses Center for Student Accessibility](#). If you are interested in applying for academic accommodations, contact the [Moses Center](#) as early as possible in the semester. If you already receive accommodations through the Moses Center, request your accommodation letters through the Moses Center Portal as soon as possible (mosescsa@nyu.edu | 212-998-4980).
3. **Health and Wellness** - To access the University's extensive health and mental health resources, contact the [NYU Wellness Exchange](#). You can call its private hotline (212-443-9999), available 24 hours a day, seven days a week, to reach out to a professional who can help to address day-to-day challenges as well as other health-related concerns.
4. **Student Support Resources** - There are a range of resources at SPS and NYU to support your learning and professional growth. For a complete list of resources and services available to SPS students, visit the [NYU SPS Office of Student Affairs site](#).
5. **Religious Observance** - As a nonsectarian, inclusive institution, NYU policy permits members of any religious group to absent themselves from classes without penalty when required for compliance with their religious obligations. Refer to the [University Calendar Policy on Religious Holidays](#) for the complete policy.
6. **Academic Integrity and Plagiarism** - You are expected to be honest and ethical in all academic work. Moreover, you are expected to demonstrate how what you have learned incorporates an understanding of the research and expertise of scholars and other appropriate experts; and thus recognizing others' published work or teachings—whether that of authors, lecturers, or one's peers—is a required practice in all academic projects.

Plagiarism involves borrowing or using information from other sources without proper and full credit. You are subject to disciplinary actions for the following offenses which include but are not limited to cheating, plagiarism, forgery or unauthorized use of documents, and false form of identification

[Turnitin](#), an originality detection service in NYU Brightspace, may be used in this course to check your work for plagiarism.

Read more about academic integrity policies at the NYU School of Professional Studies on the [Academic Policies for NYU SPS Students](#) page.

7. **Use of Third-Party Tools** - During this class, you may be required to use non-NYU apps/platforms/software as a part of course studies, and thus, will be required to agree to the “Terms of Use” (TOU) associated with such apps/platforms/software.

These services may require you to create an account but you can use a pseudonym (which may not identify you to the public community, but which may still identify you by IP address to the company and companies with whom it shares data).

You should carefully read those terms of use regarding the impact on your privacy rights and intellectual property rights. If you have any questions regarding those terms of use or the impact on the class, you are encouraged to ask the instructor prior to the add/drop deadline.