



**MBAD/DSBA 6122: Decision Modeling and Analysis
Spring 2023**

Mondays 5:30-8:15PM, Dubois Center (Uptown) 601

Instructor: Dr. Xiuli He, Belk College of Business & School of Data Science

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COURSE DESCRIPTION

This course is designed to provide students, primarily in the fields of business and economics, with a sound conceptual understanding of the role management science plays in the decision making process. This is an important course in developing decision models and their applications to management problems. The emphasis is on models that are widely used in all industries and functional areas, including operations, supply chain management, finance, accounting, and marketing.

Specific topics covered in this course include fundamental techniques such as linear, integer, goal and multi objective programming, queuing theory and applications, decision support via Monte Carlo simulation, decision making under uncertainty and risk, decision trees, and multi-criteria decision making.

In this course, students learn to *model* the business problems, *analyze and solve* the models, and then *interpret* the solutions obtained to *make recommendations* to managers. The emphasis will be on both formulating an appropriate model for a given business problem and developing an Excel based solution approach by utilizing built-in and add-in software tools like Analytic Solver Platform and Data Analysis.

Prerequisites: MBAD 5141 or equivalent. A keen interest in problem solving (logic, math, and statistics) and a desire to practice higher level analytics and applied information technology skills.

Catalog Description: An analytical approach to the management process. Generalized models for decision making with major emphasis on application of the scientific method to management problems.

LEARNING OBJECTIVES

Upon completion of the course the students should be able to

- Demonstrate proficiency in using advanced Excel, including the build-in Solver
- Formulate and solve optimization problems arising in operations and supply chain management contexts.
- Interpret and assess the results produced by the optimization models and Excel solver
- Run sensitivity and what-if analysis, understand their implications and make recommendations
- Apply the modeling approach to various business applications to make sound managerial decisions based on data
- Run Monte Carlo simulation using Analytic Solver Platform

Student Support: The details of student support resources available are provided at the following links.

Academic support: <https://niner.nationcares.uncc.edu/students/academic-support>.

Health support: <https://niner.nationcares.uncc.edu/health-support-services>

IT support: <https://help.uncc.edu/>

Laptop requirement: All upper-level (including graduate level) business students are required to have their own personal laptop computer. The policy and the minimum system requirements are found at the link <https://belkcollege.uncc.edu/laptop-policy>. Students in the DSBA program are required to follow the laptop policy [here](#).

Hardware and Software note:

- An Excel add-in--Analytic Solver Platform for Education (ASPE) is required for this class. Students are required to purchase a 140-day (1 year) license copy of ASPE from Frontline systems for \$25 (\$62.5). Please follow the installation instructions in **Analytic_Solver_Student_Installation_Guide-2023.pdf** posted on Canvas.
- You can install a desktop version of ASPE which requires Windows OS and Excel 365/2016/2013/2010. If you have a Mac and want to install the desktop version, then you need a dual-boot or virtual machine setup (such as VirtualBox or Parallels or VMWare Fusion) on your Mac. You may find out how to create a Windows Virtual Machine on MacOS [here](#).
- **If you use new MacBook Air or MacBook Pro models with the M1 chip instead of an intel processor, then the VM setup on the above link will not work for your computer. You will need to use <http://apporto.uncc.edu>.**
- You can also use the cloud-based version of ASPE which does not require download or setup program and can be used in Windows, Mac, or Excel Online. However, an Office 365 Subscription is required.
- Students with active NinerNET credentials are eligible for the Microsoft Office 365 program. You may find more information on how to access Microsoft Office 365 [here](#).

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- Once you purchase the ASPE license, you will be able to use both the desktop and cloud-based versions.

COURSE MATERIALS

Textbook:

- *Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics*, 8th edition, by Cliff T. Ragsdale, Cengage Learning, 2017. ISBN: 978-1305947412. (7th Ed. will also work).
- CENGAGE UNLIMITED eTEXTBOOKS (**\$69.99/semester**) gives students access to unlimited number of eBooks. <https://www.cengage.com/unlimited/>

Course Website: <http://canvas.uncc.edu>

- **Use of Canvas:** Canvas will be the website for course information and primary communication channel for this class. You may access UNCC Canvas from My UNC Charlotte (<https://my.uncc.edu/>) or direct type **canvas.uncc.edu/**. It's each student's responsibility to check Canvas regularly and report anything that does not match your own record (e.g., missing or wrong grade) within **SEVEN** calendar days since the date the information was posted.
- **Grades:** Grades on exams and assignments will be posted on Canvas. Please check that the grade posted matches the grade on your paper copy and notify the instructor as soon as possible in case of a discrepancy.

Withdrawal from Class:

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "U" in a course if you choose not to attend the class once you are enrolled. **The last day to withdraw from a course (grade subject to Withdrawal Policy) is March 20 2022.**

Incomplete Grade Policy:

Receiving a grade of incomplete ("I") is not based solely on a student's failure to complete work or as a means of raising his/her grade by doing additional work after the grade report time. As per [university policy](#), incomplete grades will be granted when a student who is otherwise passing has not, due to circumstances beyond his/her control, completed all the work in the course. The missing work must be completed and the final grade reported within one calendar year from the date on which the "I" grade was recorded. The instructor assigning the "I" grade may specify a shorter time than one year for completion of the work and the assignment of a final grade. If the "I" is not removed during the specified time, a grade of "F", "U", or "N", as appropriate is automatically assigned. Time extensions for the completion of an "I" beyond one year cannot be approved except by special request to the Graduate School under extraordinary circumstances. The grade of "I" cannot be removed by

enrolling again in the same course, and students should not re-enroll in a course in which they have been assigned the grade of "I".

COURSE ASSESSMENT

The course grades will be based on two exams, class participation and a final group project with a total of 235 points.

Assignments	Format	Points
Exam 1	Individual	100 points
Exam 2	Individual	100 points
Participation	Individual	10 points
Group Project	Group	25 points
Total		235 points

Exams

The two exams, **Exam 1 (March 13th)** and **Final Exam (May 8th)**, are **NOT cumulative**. ***There will be no makeup exams.*** Conflicts for the exams must be resolved before the exam dates. You should contact me at least **one** weeks prior to the exam date. Last minute requests will not be accepted. **The only reasons for not being able to sit for an examination in its announced time should be part of University policy, or a documented medical excuse.** Missing an exam without prior approval and/or providing supporting documentation within the following timeframe will lead to a grade of zero for that exam. In the event that the excuse is **approved before the exam date** (in rare case and requires supporting documentation), the student will be given a make-up exam. A student who misses an exam without prior approval, possibly due to unexpected situation on the exam day, should contact the instructor within 12 hours of the exam start date/time and provide appropriate supporting documentation to be eligible for a makeup exam. It is the student's responsibility to be aware of and follow the make-up exam policies and no special accommodations will be made for any exceptions. No makeup exam will be given after the last day of class.

"Re-grade" Requests

Any request to re-grade any component of your submissions (assignment or exam or project) has to be made within **seven (7) days** after the grade has been posted on the Canvas. Given the speed with which the course progresses, any request beyond this deadline cannot be considered. The only exception to this rule is a documented emergency. Write a brief note explaining why you think there is an error in grading. Attach a copy of the graded assignment. The instructor reserves the right to re-grade the entire contents of any submitted assignment. Your grade may go up or down.

Class attendance and participation

Each student is expected to attend every class. Participation grades will be based on the quality and impact of your class participation. Voluntary class participation will consist of voluntary contributions and occasional cold calls, usually to answer questions.

To evaluate your contribution to the class discussions, the following **criteria** are to be applied:

- Is the comment accurate, reflecting case facts?
- Does the comment add to our understanding of the problem situation?
- Is the comment timely and linked to the comments of others?
- Does the comment move the discussion along by giving a new perspective?
- Does the comment reflect a concern for maintaining a constructive and comfortable classroom atmosphere?
- Is the comment clear and concise?

As with any medical absence, it is a student's responsibility to contact you if they are unable to attend class because they are ill. I may ask for a standard absence verification from the student for extended absences. They should work through [Student Assistance and Support Services](#).

DISABILITY POLICY

UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability Services early in the semester. For more information on accommodations, contact the Office of Disability Services at 704-687-0040 or visit their office in Fretwell 230.

DIVERSITY POLICY

The University of North Carolina Charlotte and the Belk College of Business strive to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

ACADEMIC INTEGRITY

Students have the responsibility to know and observe the requirements of [The UNC Charlotte Code of Student Academic Integrity](#) available online at <http://legal.uncc.edu/policies/up-407>. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism (which includes viewing others work without instructor permission), abuse of academic materials, and complicity in academic dishonesty. ***This forbidding includes sharing/copying work between individuals or teams without permission of instructors.*** Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases the course grade is reduced to failing. Students are expected to report cases of academic dishonesty to the course instructor.

Title IX Reporting Expectations

UNC Charlotte is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. UNC Charlotte has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with civil protective orders, and more.

Please be aware that all UNC Charlotte employees, including faculty members, are expected to relay any information or reports of sexual misconduct they receive to the Title IX Coordinator. This means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I am expected to [report the information to the Title IX Coordinator](#). Although I am expected to report the situation, you will still have options about how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone confidentially, you can contact the following on-campus resources, who are not required to report the incident to the Title IX Coordinator: (1) University Counseling Center (counselingcenter.uncc.edu, 7-0311); or (2) Student Health Center (studenthealth.uncc.edu, 7-7400). Additional information about your options is also available at titleix.uncc.edu under the “Students” tab.

All students are required to abide by the UNC Charlotte [Sexual Harassment Policy](#) and the policy on [Responsible Use of University Computing and Electronic Communication Resources](#). Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards.

Accommodations for Religious Observances

UNC Charlotte provides reasonable accommodations, including a minimum of two excused absences each academic year, for religious observances required by a student’s religious practice or belief. Please refer to <https://legal.uncc.edu/policies/up-409> for details on requesting such accommodations.

Copyright Ownership in Course Materials

The lectures and course materials, including presentations, tests, exams, outlines, and similar materials, are protected by copyright. The instructor is the exclusive owner of copyright in those materials created by the instructor. You are encouraged to take notes and make copies of course materials for your own educational use. However, you may not, nor may you knowingly allow others to reproduce or distribute lecture notes and course materials publicly without express written consent of the instructor. This includes providing materials to commercial course material suppliers such as Course Hero and other similar services. Students who publicly distribute or display or help others publicly

distribute or display copies or modified copies of an instructor's course materials may be in violation of University Policy 406, The Code of Student Responsibility. Similarly, you own copyright in your original papers and exam essays. If the instructor is interested in posting your answers or papers on the course web site, the instructor will obtain your written permission.

TENTATIVE COURSE SCHEDULE

Date	Topics	Chapter	Due
1/9	Syllabus & Introduction to Modeling	Ch1&Ch2	
1/16	MLK Day- No Class		
1/23	Modeling and Solving LP Problems in a Spreadsheet	Ch3	
1/30	Modeling and Solving LP Problems in a Spreadsheet	Ch3	Group formation by 9:00pm
2/6	Sensitivity Analysis	Ch4	
2/13	Sensitivity Analysis	Ch4	
2/20	Network Modeling and Exam Review	Ch5	
2/27	Spring Break- No Class		
3/6	Network Modeling and exam review	Ch5	
3/13	Exam 1	Ch2-Ch5	
3/20	Integer Linear Programming	Ch6	
3/27	Integer Linear Programming (Guest Speaker TBA)	Ch6	Project proposal due 9:00pm
4/3	Goal Programming and MultipleObjective Optimization	Ch7	
4/10	Goal Programming and MultipleObjective Optimization	Ch7	
4/17	Wok on Group Project		
4/24	Decision Support Using MonteCarlo Simulation Approach	Ch12	
5/1	Decision Support Using MonteCarlo Simulation Approach and Exam Review	Ch12	Project report due 11pm.
5/8	Final Exam (Non-cumulative) Time: 5:00pm-7:30pm	Ch6, Ch7, Ch12	

Note:

- These descriptions and timelines are **subject to change** at the discretion of the instructor. Notice of such changes will be by announcement in class or by changes to this syllabus posted on Canvas.
- Check the updated final exam schedule for Spring 2023:

<https://ninercentral.charlotte.edu/sites/ninercentral.charlotte.edu/files/media/Spring-2023-FE-Table.pdf>

FINAL PROJECT GUIDELINES

Final Project:

- In addition, a 1-page project proposal (one per group) should be turned in by **9:00pm March 27th** with the following items:
 - Group members (with emails listed)
 - Project title
 - Project type
 - Description
 - Plan (*bullet points* outlining how you will complete the project by the due date)
- Please submit a final project report (one per group) by **11PM May 1st**. The report should follow the guidelines below:
 - 12 point font, 1 inch margins on all sides, line spacing of 1.5
 - No more than **12 pages** (including references, figures, and appendices)

Option 1:

- A group can select a **business** that he/she has access to and use the technique learned in this course to help the business to optimize on their operations. Describe and define what the problem is, and outline the logic used to formulate the problem. Then describe the assumptions that were made, use the data to implement the model and discover the potential business impacts.

Option 2:

- A group can select a case from the book at the end of Chapters 2-12. Then the group use the technique learned in this course to do a thorough case analysis. Describe and define what the problem is, and outline the logic used to formulate the problem. Then describe the assumptions that were made, use the data to implement the model and discover the potential business impacts.

Group formation link:

<https://docs.google.com/document/d/12OF79e2h4ckMv0nlMWTodRGyQvMCeJtCG9LpgBNLxNI/edit?usp=sharing>