



BA 584: Supply Chain Analytics Spring 2024

Professor Contact Information & Office Hours

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Office: GH 208

Office Hours: Zoom office hours for assignments listed on Blackboard.

Preferred Communication Method and Expected Response Time

E-mail (≤ 24 hrs.). If you have questions about an assignment, please attach your current work-in-progress (Excel file).

Course Description

In a dynamic, competitive world, a company's effectiveness depends significantly on how well its resources are managed. Managing the company's critical performance dimensions - quality, speed, flexibility, and cost - requires a thorough understanding of physical and information *processes* by which inputs of materials, labor, capital, and information are transformed into products and services for customers. Additionally, one of the main features of today's world is the ubiquitous use of technology. Management has access to sophisticated decision models in almost every branch of industry: revenue management and crew scheduling in the airline industry; scheduling of intensive care units in hospitals; supply chain management and inventory management in manufacturing; financial models to minimize risk and maximize return; routing and pricing in telecommunication networks. In each of these industries, *quantitative decision models (analytics)* are a key to success. The central topics of study are linear, integer, and nonlinear

programming. We place special emphasis on linear programming, particularly on modeling *supply chain applications* and *sensitivity analysis*. This course follows a *practical spreadsheet-based* approach to provide hands-on experience with Excel Solver. By the end of the course, you will develop intuition to identify managerial problems amenable to optimization technology, and skills to build and interpret analytic models in supply chain management with *management science* perspective.

Prerequisites (If any)

None

Required Text(s) and Materials

Spreadsheet Modeling & Decision Analysis, by Cliff T. Ragsdale, 7th ed. ISBN: 978-1-285-41868-1. Newer versions of the book would be fine, too. There are 4 ways to access this book: New (hardcover), Used, E-book or Rent. Renting may be the cheapest option. The link for Amazon: [Click here!](#)

Recommended/Optional Texts and Materials (if applicable)

Optional reading materials (articles) are posted on Blackboard.

Course Format:

100% asynchronous online course with no required synchronous meetings. The course is structured in terms of modules. There are 5 modules.

Course Objectives/Outcomes

Course Objectives	Practice/Experience in Course	Assessment of Outcome
Students will understand how decision support tools can be used for supply chain challenges, opportunities, and problems	Homework 1, 2, 3; Quiz 1; Final Exam; Final Project	Tests are graded automatically on Blackboard. For the assignments and final project, students get feedback for the modeling and Excel work individually.
Students will be able to determine correct question framing for supply chain analysis and decision making by defining the right data set and considering efficiency and business value.	Homework 1, 2, 3; Quiz 1, 2, 3; Final Exam; Final Project	Tests are graded automatically on Blackboard. For the assignments and final project, students get feedback for the modeling and Excel work individually.
Students will utilize modeling techniques for a wide range of supply chain network issues, including design, aggregate planning and resource allocation decisions, estimated product costs, transportation and logistics analysis.	Homework 2, 3; Quiz 2, 3; Final Exam; Final Project	Tests are graded automatically on Blackboard. For the assignments and final project, students get feedback for the modeling and Excel work individually.
Students will apply descriptive, predictive, and prescriptive data analytics in supply chain management applications, including forecasting, inventory management, sales and operations planning, procurement management, and risk management.	Homework 1, 2, 3; Quiz 1, 2, 3; Final Exam; Final Project	Tests are graded automatically on Blackboard. For the assignments and final project, students get feedback for the modeling and Excel work individually.

Course Requirements

There are 3 assignments, 3 quizzes, Final Exam, and Final Project in this course.

Course Policies

Anticipated Response Time for Grading and Feedback: 48 hours after deadline of the corresponding assignment.

Homework:

- There are 3 assignments that each of them is worth 15% of the total grade (100%).
- Assignments must be typed in Word, Excel, Blackboard or a similar program and submitted via Blackboard.
- If you have charts, calculations on a paper, you can scan it or take a picture of it. You should put scanned work or picture in Word document before submitting it.
- Late submissions will be penalized by 10% per day.
- None of the homework scores will be dropped.
- Due dates will be on a Sunday for the corresponding week, 11:59 pm.

Quiz:

- There are 3 quizzes that each of them is worth 5% of the total grade (100%).
- Questions will be multiple-choice.
- You will be given limited time to complete the exam.
- None of the quiz scores will be dropped.

Final Exam:

- The final exam will be held in Blackboard.
- The final exam accounts 20% of the total grade.
- This exam is open-book, open-notes, open-everything.
- You will be given limited time to complete the exam.
- The final exam will include both quantitative and qualitative questions related to the readings and lecture slides.
- Questions will be multiple-choice.

Final Project:

- The description is be posted on Blackboard.
- The final projects accounts 20% of the total grade.

Grading Scale

Homework (3)	45%
Quiz (3)	15%
Final Exam	20%
Final Project	20%
TOTAL	100%

A	$\geq 90\%$
B	80% - 89%
C	70% - 79%
D	55% - 69%
F	$\leq 54\%$

Course Schedule

Due dates for each assignment and test are posted on Blackboard.

Module 1 (Weeks 1 & 2):

Introduction and Overview; Linear Programming; Solver; Supply Chain Applications: Optional Reading Materials

Quiz 1

Module 2 (Weeks 2 & 3):

Sensitivity Analysis; Network Models; Supply Chain Applications: Optional Reading Materials

Homework 1

Zoom Office Session for Homework **1** – WEEK **2**

Module 3 (Weeks 3 & 4):

Integer Programming; Supply Chain Applications: Optional Reading Materials

Quiz 2

Homework 2

Zoom Office Session for Homework **2** – WEEK **3**

Module 4 (Weeks 4 & 5):

Non-Linear Programming; Supply Chain Applications: Optional Reading Materials

Quiz 3

Homework 3

Zoom Office Session for Homework **3** – WEEK **5**

Module 5 (Weeks 6 & 7):

Review Session

Final Project (due during finals week – WEEK **7**)

Final Exam (due during finals week – WEEK **7**)

Technology and Technical Skill Requirements

- Students must be proficient in the use of computers, the Internet, browsers, Microsoft Office Word, and other common applications.
- Students must be able to use their WKU email, as well as the following tools in Blackboard Ultra: course messages, assignments, discussion board forums, tests, blogs, journals, wikis, and groups.
- Some courses may require Zoom or Teams for meetings.
- [Adobe Acrobat Reader](https://get.adobe.com/reader/) may be needed to read some files. This plug-in is available free. (URL: <https://get.adobe.com/reader/>)
- Students may be required to submit assignments as Microsoft Word documents (.docx), using the most recent Microsoft Office suite. Microsoft Office 365 is provided to WKU students free of charge at the following address: <https://td.wku.edu/TDClient/34/Portal/KB/ArticleDet?ID=12>
- Excel Solver or Analytical Solver Platform will be needed in this course. How to enable Solver in your Excel is shown by the video available on Blackboard.

Technology Assistance

If you have technical problems, please contact of the following:

- WKU Information Technology Services Helpdesk:
<https://www.wku.edu/its/service-desk/> or call 270-745-7000
- Blackboard Student Support:
<https://help.blackboard.com/Learn/Student>

University Policies

ADA Accommodations

In compliance with university policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, Room 1074. The SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

Title IX/ Discrimination & Harassment

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Sex and Gender-Based Discrimination, Harassment, and Retaliation (#0.070) and Discrimination and Harassment Policy (#0.2040). Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Executive Director, Office of Institutional Equity/Title IX Coordinator, Ena Demir, 270-745-6867 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender-based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

COVID-19

All students are strongly encouraged to get the COVID-19 vaccine. In accordance with WKU policy, all students must call the WKU COVID-19 Assistance Line at 270-745-2019 within 4 hours of testing positive for COVID-19 or being identified as a close contact to someone who has tested positive. The COVID Assistance Line is available to answer questions regarding any COVID-19 related issue. This guidance is subject to change based on requirements set forth by federal, state, and local public health entities. Please refer to the Healthy on the Hill website for the most current information. www.wku.edu/healthyonthehill

WKU Counseling and Testing Center

The university experience should be challenging, but not overwhelming. To this end, the WKU Counseling Center provides a variety of services to help strengthen students' capacity to tolerate distress, form healthy relationships,

and seek healthy expressions of their ideals and values. If you would like to speak with someone, you may contact WKU's Counseling and Testing Center at 270-745-3159 or use their Here To Help service at <https://www.wku.edu/heretohelp/heretohelpemail.php>. If you need immediate help, please visit the Counseling Center in 409 Potter Hall or call the 24-hour emergency help line at 270-745-2548.

Big Red Backpack

The Big Red Backpack program is the title of WKU's partnership with Barnes & Noble College for their First Day Complete initiative. Big Red Backpack is a course materials delivery program that ensures students have their required course materials on the first day of class and may reduce the costs of materials for many of their courses. Enrollment in the program occurs automatically when students register for classes. Students may opt out of the program each semester, as long as they choose to opt out for all of their classes.

Students MUST carefully and completely follow all instructions regarding the Big Red Backpack Program. Those instructions will be provided by:

1. An email to all Topper email addresses from the Big Red Backpack Program one month prior to the start of classes.
2. The Big Red Backpack Program site: <https://www.wku.edu/bigredbackpack/>.

Students should refer to the Big Red Backpack Program site referenced above for opt-out deadlines and any additional details.

Regular And Substantive Interaction (RSI) Statement

- Providing constructive feedback on student assignments, which identifies specifically what has been done correctly, needs improvement, or guides students to the next steps of learning.
- Providing information or responding to questions about the content of a course or competency.
- Providing timely and detailed feedback on assignments within 48 hours of submission.