MGT 313 – Decision Modeling
Spring 2024 (Section 700)
Course Syllabus

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Instructor Support: https://wku.blackboard.com/

Office Hours: By appointment

Office Hours Location: GH 215 **AND** Zoom online meeting
                           (https://wku.zoom.us/j/92945354943)

Class Meeting Time and Location:

Weekly videos posted on the course Blackboard (https://wku.blackboard.com/)

Course Overview

With spreadsheets being actively used on more than 90% of office desks in the workplace today, companies are highly valuing employees with strong Excel skills. While nearly everyone lists "Excel skills" on their resume as an area of expertise, few people actually know how to create Excel applications to be truly self-contained decision-support systems that can be confidently passed around the company and used by others. Are you aware that Excel can actually solve large-scale business problems for you as opposed to just calculating formulas?

Have you heard of "Data Analytics"? With the emergence of "Big Data" in a wide array of disciplines, companies are desperate to find employees with skills in data analytics. This course will provide an introduction to the concepts and methods of Management Science (also known as Operations Research), which involves applying relatively simple tools to solve complex business problems. It also provides a foundation for modeling with spreadsheets. Successful completion of the course will help students become more skilled builders and consumers of models and model-based analyses. As a result of this course, students will become more confident in understanding and using models, both in other courses and on the job. The focus will be on managerial application and understanding of the techniques, rather than on their rigorous mathematical development. Material learned in this course is particularly appropriate for business, math, and engineering majors, all of whom will pick up significant new consulting and Excel skills.

Expected Student Learning Outcomes

1. Develop skills in formulating mathematical models that can be used to improve decision-making within an organization.
2. Learn to formulate, solve, and interpret practical decision-making and planning models using spreadsheets.
3. Gain ability to plan spreadsheet models to solve practical business problems in a technically sound and organized manner.
4. Identify conditions under which different modeling concepts and techniques would be adequate for analysis.
5. Strengthen computer skills, focusing on how to use the computer to support decision-making, as required to develop into effective managers and consultants.

Course Prerequisites:

ECON 206, CIS 243, and COBA Course Eligibility with a score of 2.

Required Course Material:

1. Lecture notes will be available on **Blackboard** (https://wku.blackboard.com/) by topic; or a complete bound version of the notes may be purchased from the **WKU Print Center** (currently operating out of Liberty Imaging, 3021 Nashville Road).

   Students are strongly encouraged to have a set of printed or electronic notes when viewing class videos. The notes provided will be *incomplete* initially and eventually completed as part of classroom discussions.

2. Excel and AMPL files will be available on the course website (Blackboard).

3. McGraw-Hill Education **Connect**, online homework and assessment tool, packaged with the custom book and including access to *Introduction to Management Science and Business Analytics: A Modeling and Case Studies Approach with Spreadsheets*, 7th Ed, by Frederick Hillier and Mark Hillier.

   This class participates in The WKU Store's "First Day Access" program. As part of this program, MyOMLab, along with the required textbook for this course, will be pre-loaded on your course BlackBoard account.

   Students who wish to opt-out of this program may do so, but by opting out you agree to have your e-book access terminated and you will be responsible to obtaining the required package on your own. You will see the opt-out link in Blackboard as you access the e-book.

Recommended Course Material:

1. Hamdy A. Taha, *Operations Research: An Introduction, 10th Edition*, Pearson, 2017 (WKU Store).

2. Albright, S. Christian, VBA for Modelers: Developing Decision Support Systems with Microsoft® Office Excel®, Fifth Edition, Boston, MA: Cengage Learning, 2016.

3. Cliff Ragsdale, *Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Business Analytics*, *8th Edition*, Cengage, 2018 (WKU Store).

Computer Requirements

MS Excel

WKU students can download and install Microsoft Office 365 ProPlus free of charge. Microsoft Office 365 gives you access to applications like Word, Excel, PowerPoint, and OneNote. Step-by-step instructions for your Windows / macOS computers or iOS devices could be found at: https://www.wku.edu/its/sms/microsoft_sa.php

Students must have access to a computer that has Excel 365, Excel 2016, Excel 2013, Excel 2010, or Excel 2007 installed with the "Analysis ToolPak" and "Solver" Add-Ins activated. (Presentations and notes will be based primarily on Excel 2013 and 2016.) **Students are strongly encouraged to bring a computer to every class** and will further be asked to download and install various files from the course website. TopperTech offers laptop reservations for WKU students at: https://www.wku.edu/its/toppertech/

AMPL

AMPL (A Mathematical Programming Language) is a modeling language, which is widely used among practitioners and researchers alike for quickly formulating and solving large-scale optimization problems. Students enrolled in this course can freely download and install AMPL on their personal devices for use on homework assignments and the group project. This version is full-featured but will time out at the end of the course. **Download instructions are available in the course Blackboard.**

For Mac Users

The material will be presented based on a Windows operating environment. Excel is available for Mac computers, but there may be some possible differences in commands and keystrokes. Mac users can run Windows on a Mac by using a program such as VMWare Fusion. Alternatively, for Mac users working with Microsoft Excel for Mac, a website geared toward answering technical problems with Office for Mac is: https://answers.microsoft.com/en-us/msoffice/forum/mso_mac?auth=1

Grading:

	Weight	Maximum Group Size
Problem Sets	36%	1
Midterm exam	30%	1
Final exam	30%	1
Contribution to discussion boards*	4%	1

* Based on the frequency and quality of posts, comments, and discussion

Up to 4% of extra credit may be earned based on class participation (details will be provided later). After class participation adjustment (if any), the following letter grades based on absolute percentage score will be guaranteed:

90% and above	**A**
80 – 89.99%	**B**
70 – 79.99%	**C**
55 – 69.99%	**D**
Less than 55%	**F**

Exams

There will be two exams during the semester, including a non-cumulative final exam. All exams are open book, open notes, and a calculator is allowed. However, devices such as computers, tablets, phones, and any materials available in e-book format are not allowed during the exams. The content and format of the exams will be announced in class. If you cannot take an exam as scheduled due to an emergency, you must notify the instructor as soon as possible with official documents for special arrangements.

Midterm Exam: Available on Gradescope (100 minutes max duration)
                  12:01 AM on Thursday, February 29 – 11:59 PM Sunday, March 3
                  Covers Modules I – III.

Final Exam: Available on Gradescope (120 minutes max duration)
                  12:01 AM on Tuesday, April 30 – 11:59 PM Saturday, May 4
                  Covers Modules IV – VI.

Prior to each exam, a practice exam will be made available on the course Blackboard (https://wku.blackboard.com/).

Tentative Course Outline:

Module	Topic	Week(s)	Description
I	1	1	**Basic Excel Skills** Data / formula entry, Formatting, Functions and function wizard, Creating Charts
	2	1, 2, 3	**Model Analysis Using Spreadsheets** Breakeven analysis, Goal Seek, Sensitivity analysis, Data analysis
II	3	4, 5	**Monte Carlo Simulation for Decision Support** Simulation basics, Risk analysis, Tools for analyzing results
III	4(a)	5, 6, 7	**Mathematical Programming** Introduction to optimization, Linear programming
IV	4(b)	8, 9, 10, 11, 12	**Mathematical Programming** Network modeling, Integer programming, Multi-objective optimization
V	5	13, 14	**Waiting Lines and Queuing Theory** Queuing system configurations, Queuing models, Managing the waiting process
VI	6	13, 14	**Decision Analysis** Decision Theory characteristics, Probabilistic and non-probabilistic methods, Decision Trees, Analytical Hierarchy Process

Note: Class outline and schedule may be modified to meet the needs of the students better.

Problem Sets:

Six problem sets will be assigned during the class. The problems are designed to give students practice in applying the quantitative techniques learned in class. Typically, the problem sets will be assigned upon completion of the lecture regarding the material covered in the problem set and will be due (typically) between 1 to 2 weeks after being assigned. Students may work in groups containing up to 3 members. The *tentative* homework and exam schedule is as follows:

Assignment	Assigned	Due
Problem Set 1	Wednesday, 01/24	Wednesday, 01/31
Problem Set 2	Monday, 02/05	Wednesday, 02/14
Problem Set 3	Wednesday, 02/14	Wednesday, 02/28
Midterm Exam	*Thursday, February 29 – Sunday, March 3*	
Problem Set 4	Wednesday, 03/06	Wednesday, 04/03
Problem Set 5	Wednesday, 04/03	Monday, 04/15
Final Exam	*Tuesday, April 30 – Saturday, May 4*	

Regular and Substantive Interaction:

The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive Interaction at WKU, please visit the [Regular and Substantive Interaction in Online and Distance Learning webpage](#).

In this course, regular and substantive interaction will take place in the following ways:

- Instructor participation in weekly discussion boards,
- Synchronous exam review sessions with the instructor and students,
- Weekly video and/or email announcements,
- Scheduled meetings and help sessions for the group project with the instructor, and
- Timely, detailed, and personalized feedback on assignments provided via Gradescope.

Class Participation:

Class attendance is expected and *strongly recommended*. Students can improve their grades by **up to 4%** by attending and actively participating in class (the maximum available credit may be any value between 0 and 4). The instructor will do his best to assign bonus points objectively; thus, they will not be open to negotiation. Attendance will be taken randomly during the semester.

The following can be a guideline for the allocation of bonus points.

Attendance
Up to 2%   You have completely viewed most to nearly all of the classes.
Up to 4%   You have completely viewed nearly all to all of the classes.

Most grading in college (and in this course) is based on achievement. This class attendance bonus allows students to improve their grades based on effort. If any students are struggling with their assignments, then they have no excuse for not striving to receive a 4% class attendance bonus. This represents a very easy way to improve your grade. In addition, active class participation should improve the class experience for everyone.

Office Hours:

Office hours are intended to be an opportunity to clarify any questions you have regarding course materials, get help on problem sets, and/or ask questions before the exams. They are **NOT** intended to be a place for you to attempt your homework for the *first time*. You are encouraged to attempt them beforehand and come to office hours prepared with questions. Once your questions have been answered, you are expected to make another attempt to solve the problems. If you then have further questions (even if it is 5 minutes later), we can discuss them.

I am not trying to discourage you from attending office hours; instead, it is quite the contrary. I want you to use office hours to be an effective component of your learning process and maximize your opportunities to succeed.

To provide you with more flexibility, **all office hours will be hosted as both face-to-face and Zoom online meetings**. The Zoom meeting is directly accessible via Blackboard.

ChatGPT and Generative AI:

In general, I expect that the work you submit in this class will be your own and **you are not authorized to use artificial intelligence (AI) tools such as ChatGPT and Bard**. However, there will be specific assignments or activities in which we will utilize these tools to enhance your learning experience. In these instances, I will provide you with additional information about the assignment and how AI will be employed and cited. Again, unless permission is granted, you are expected to complete assignments without substantive assistance from others, including AI tools.

ADA Accommodation:

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.

Academic Integrity/Honor Code:

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course.

Students assume full responsibility for the content and integrity of the academic work they submit. In MGT 313, cheating includes but is not limited to the following actions which are thus considered as violations of the academic honor code:

1. Use of prohibited items during exams.
2. Represent the work of others as their own.
3. Copying other students' work, however minor, during the exam.
4. Use or obtain unauthorized assistance in any academic work.
5. Give unauthorized assistance to other students.
6. Modify, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit.
7. Misrepresent the content of submitted work.
8. Signing in for class on other students' behalf.
9. Making another student sign in for class on one's behalf.

If a student is unclear about whether a particular situation may constitute an honor code violation, the student should meet with the instructor to discuss the situation. Students who violate the honor code will receive a **failing grade** and will be reported to the Office of Student Conduct.

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.

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 270-843-4357.

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.

Other Resources:

- Student Resource Portal: https://www.wku.edu/online/srp
- Sexual Assault Resources: https://www.wku.edu/titleix
- Counseling Center: https://www.wku.edu/heretohelp
- Writing Center assistance: https://www.wku.edu/startcenter
- Active Shooter Preparedness: https://youtu.be/chr4C4dgvHs
- WKU Police Department: https://www.wku.edu/police

*** SYLLABUS MAY BE REVISED BY NOTICE, BY EMAIL, OR ON BLACKBOARD ***