

BADM 513 Erie - Quantitative Methods for Business

Course Syllabus

INSTRUCTOR INFORMATION

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Office Hours: Tuesday 12:00 pm - 3:45pm, and by appointment (to be conducted through Zoom).

The best way to reach me is via email. You can expect me to respond to your email within a 24-hour window, or often sooner.

COURSE INFORMATION

Class Name / Section: BADM 513 - 001

All of the terms and conditions noted in this syllabus are subject to change if classes are canceled because of adverse weather conditions, other emergencies or at the professor's discretion.

Course Prerequisites: BADM 501 and BADM 502

TEXTBOOK

An Introduction to Management Science – Quantitative Approaches to Decision Making, 15th Edition, David Anderson, Dennis Sweeney, Thomas Williams, Jeffrey Camm, James Cochran, Michael Fry, and Jeffrey Ohlmann. South-Western Cengage Learning, 2019

The book is available in multiple formats including digital and bound copies from the publisher, Behrend Bookstore and from third-party sellers. I am listing some options below for your consideration:

1. You can buy a new or used copy of the textbook from sellers like Amazon and Barnes & Noble. I believe Amazon offers rental options as well. The most recent edition of the book is 15th but older editions of the book (e.g., 13th, 14th, 14th revised) are also acceptable. The course content will reference the 15th edition so the page numbers or homework question numbers might be different in the older editions, and it is the student's responsibility to check this information is consistent. As a further note, we do not need an access code or printed access code for this course.
2. You can go to the publisher's web site at [Cengage](https://www.cengage.com). Cengage offers multiple options including, E-book (1-semester access), Rental Print Book, and Bound Book. Please visit the publisher's website for the most up-to-date price information.
3. You can purchase a subscription code from Behrend Bookstore. This one-semester-long subscription is for a service called Cengage Unlimited which provides access to the E-book format of our textbook and 22,000 more digital resources. It also allows you to keep access to a maximum of 6 books for a year. I recommend this option only if you prefer a digital copy

of the textbook, want to access the content after the semester ends (up to a year), and you are possibly taking some other courses within the next academic year which adopt a Cengage-published textbook. Otherwise, I believe you are better off with either of the options listed in 1 and 2 above.

COURSE OVERVIEW AND OBJECTIVES

Recent advances in computing power and technology have made it possible to store and access large sets of data. Today, organizations are increasingly beginning to understand the tremendous value in utilizing data for making better business decisions and improving performance. This is apparent in the growing trend of “business analytics” which makes the candidates with a mix of business and analytics skills in high demand. Realizing the full potential of data typically requires the use of sophisticated quantitative and analytical methods. These methods are useful in transforming data into meaningful information, discovering patterns or relationships, understanding and improving system behavior, and predicting performance; all of which facilitate data-driven and fact-based decision making.

This course is designed to introduce you a set of most widely used quantitative methods for managerial decision-making, including optimization modeling, stochastic modeling, decision analysis, and forecasting. These methods are not limited to a certain domain but are applicable across all business functions in organizations. Techniques such as linear programming, integer programming, simulation, waiting line analysis, decision tree analysis, and forecasting are presented in-depth.

The main goal of this course is to stimulate quantitative thinking and make you intelligent consumers of quantitative models. Upon successful completion of this course, you will:

1. Be familiarized with the use of quantitative analysis in making informed decisions.
2. Develop a toolkit with a number of quantitative techniques applicable to analyze managerial problems in a variety of business domains.
3. Learn how to apply the major techniques to bring systematic solutions to complex problems and interpret and communicate the solutions effectively to relevant parties.
4. Gain experience in using a computer to assist in problem-solving.
5. Enhance your analytical training both for professional life and other advanced MBA courses.

To achieve these goals, special emphasis will be given on problem modeling and application of the techniques to problem-solving. Throughout the semester, students will be exposed to a broad range of applications and extensive use of computer software (in particular, Microsoft Excel and special add-ins) to practice the techniques.

CLASS VIDEO RECORDINGS

Video recordings of class lectures will be part of the classroom activity. The video and audio recording are used for educational use/purposes and may be made available to all students presently enrolled in the class. For purposes where the recordings will be used in future class sessions/lectures, any type of identifying information will be adequately removed from the videos.

REQUIREMENTS AND GRADING

Your final letter grade will be based on your scores from the exams, assignments, project, simulation exercise, and other exercises. Many of these assessment activities will be completed in groups of two and should be taken as opportunities for continued learning.

Exams

There will be two midterm exams. They will contribute equally towards your final grade and will be non-cumulative with the scopes as seen in the course schedule. Each exam will consist of two parts: the first part will focus on the concepts, terminology, and understanding of the tools and techniques; the second part will test your quantitative problem-solving skills using computer software.

Assignments

Homework will be assigned approximately weekly, and will typically be due one week from the date of assignment. One submission per group will be required. Assignments will often include case problems with deliverables such as managerial reports, which can particularly benefit from group work. The release and due dates of all assignments are announced on the course website. Late submissions of assignments will not receive any credit.

Project

There will be a term project that will be completed in groups. Two options are offered for the project and you are asked to select **only one of the two options**. The first option is a **case study of a beer manufacturer's supply chain design** and the second is the **analysis of a real-world problem of your choice**. Both options are aimed to help you improve your skills in structuring, modeling, and solving a real-life inspired problem. You will be asked to write a report with recommendations supported by a detailed technical analysis. If you choose to work on the second option, you will also be asked to present your work at the end of the semester (instead of the simulation exercise.)

Simulation Exercise

Littlefield Technologies simulator will be used. Littlefield Technologies is a web-based, discrete-event simulator of a simple factory consisting of four steps on three stations and a raw materials inventory. Each group will compete with other groups over the web while developing operations management skills. The simulation will be active for two weeks, during which you will monitor your factory and your performance relative to your peers, periodically making changes to your factory. The deliverables will include a two-to-four page report explaining your strategy during the simulation. Grade is based on your group's performance, summary report, and presentation of your strategy. Note: Only if your team chooses to work on project option one, you will be asked to do your presentation on the Littlefield Technologies simulation.

Test Yourself Questions, Peer Evaluation, and Course Participation

Test-Yourself questions are embedded in the course content and are intended to guide you during your learning process. Test-Yourself questions are individual assignments.

Throughout the semester, each group member is expected to contribute equally to all of the group work. You will be asked to fill out a peer evaluation form at the end of the semester. You can earn participation points by contributing to the discussion forums.

Grading scale

Your final grade will be determined based on the following schemes:

Activity	Points towards final grade
Midterm Exam I	200 pts
Midterm Exam II	200 pts
Assignments	170 pts
Project	100 pts
Simulation Exercise	90 pts
Peer Evaluation and Participation	15 pts
Test Yourself Questions	25 pts
TOTAL	800 pts

Grade	Percent Range	Grade	Percent Range
A	744 (93%)	C+	560 (70%)
A-	720 (90%)	C	520 (65%)
B+	680 (85%)	D	480 (60%)
B	640 (80%)	F	<480
B-	600 (75%)		

COURSE POLICIES

Office Hours: You are encouraged to utilize the office hours to discuss your questions or comments. You are also welcome to reach me through email (more preferable) and phone (during office hours).

Course Webpage: The course webpage, accessible through Canvas, will be used to make announcements and to post all course materials. You are responsible for all the content posted and announced on the webpage. Please log onto Canvas at least once a day so that you do not miss any important messages.

Grades: If you have any questions regarding your grade received on homework assignments, exams, or case, you must contact the instructor within a week of getting the grade.

ACADEMIC INTEGRITY

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Violations of academic integrity include but are not limited to:

Cheating: Using crib sheets; pre-programming a calculator; using notes or books during a closed book exam.

Copying on a test: Looking at other unsuspecting students' exams and copying; copying in a complicit manner with another student; exchanging color-coded exams for the purpose of copying; passing answers via notes; discussing answers in exam.

Plagiarism: Fabricating information and/or citations; copying from the Internet or submitting the work of others from professional journals, books, articles and papers; submitting other students' papers or lab results or project reports and representing the work as one's own; fabricating, in part or total, submissions and citing them falsely.

Acts of aiding or abetting: Facilitating academically dishonest acts by others; unauthorized collaboration of work; permitting another to copy from exam; writing a paper for another; inappropriately collaborating on home assignments or exams without permission or when prohibited.

Unauthorized possession: Buying or stealing exams; failing to return exams on file; selling exams; photocopying exams; any possession of an exam without the faculty member's permission.

Submitting previous work: Submitting a paper, case study, lab report, or any assignment that had been submitted for credit in a prior class without the knowledge and permission of the instructor.

Tampering with work: Changing one's own or another student's work product such as lab results, papers, or test answers; tampering with work either as a prank or in order to sabotage another's work.

Ghosting or misrepresentation: Having another student take a quiz, an exam, or perform an exercise or similar evaluation in one's place.

Altering exams: Changing incorrect answers and seeking favorable grade adjustments when instructor returns graded exams for in-class review and subsequently collects them, asserting that the instructor made a mistake in grading. Other forms may include changing the letter and/or the numerical grade on a test.

Computer Theft: Electronic theft of computer programs or other software, data, images, art, or text belonging to another.

EDUCATIONAL EQUITY STATEMENT

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage at <http://equity.psu.edu/reportbias/>.

ACCESSIBILITY STATEMENT

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Student Disability Resources Web site provides contact information for every Penn State campus at <http://equity.psu.edu/student-disability-resources/campus-disability-coordinators>. For further information, please visit the Student Disability Resources Web site at <http://equity.psu.edu/student-disability-resources>.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation, visit <http://equity.psu.edu/student-disability-resources/applying-for-services>. If the documentation supports your request for reasonable accommodations, your local campus disability coordinator provide you with an accommodation letter. **Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible.** You must follow this process for every semester that you request accommodations.

COURSE SCHEDULE

All lesson assignments are due on Wednesday by midnight. Detailed Course Schedule is provided in Canvas.

Tentative Teaching Schedule		
Week of	Material	Assignments and Due Dates
August 23	Zoom Meeting: August 26 Course Orientation Module 1 Introduction	M1 - Homework #1 (due Sept. 02)
August 30	Module 2 Lesson 1 - Linear Programming	M2L1 - Homework #2 (due Sept. 09)
September 6	Module 2 Linear Programming - Lesson 2 (Sensitivity Analysis) Module 2 Linear Programming - Lesson 3 (Applications)	M2L2 - Homework #3 (due Sept. 16)
September 13	Module 2 Linear Programming - Lesson 4 (Distribution and Network Models)	M2L4 - Homework #4 (due Sept. 23)
September 20	Module 2 Linear Programming - Lesson 5 (Advance Applications) Midterm Exam 1 Review Project Announcement & Introduction	Midterm Exam 1 - Practice Questions (due Sept. 30)
September 27	Zoom Meeting: September 30 Module 8 Lesson 1 - Time Series Forecasting Techniques Midterm Exam 1	Midterm Exam 1 – Part I (September 30) Midterm Exam 1 – Part II (October 01)
October 4	Module 3 - Integer Linear Programming	M3 - Homework #5 (due Oct. 14)
October 11	Module 4 - Waiting Line Models	M4 - Homework #6 (due Oct. 21) Project Progress Report (due Oct. 21)

October 18	Module 5 - Capacity Analysis and Littlefield Technologies Simulation Overview Registration deadline for Littlefield Technologies simulation (October 21)	Preparation for Littlefield Technologies simulation (due October 26)
October 25	Littlefield Technologies simulation (Round 1) starts: October 26 Module 6 Simulation - Lesson 1 (Introduction)	M6 - Homework #7 (due Nov. 04)
November 01	Module 6 Simulation - Lesson 2 (Applications) Midterm Exam 2 Review	Midterm Exam 2 - Practice Questions (due Nov. 11)
November 08	Littlefield Technologies simulation ends (November 11) Zoom Meeting: November 11 Module 8 Lesson 2 - Causal Models, Additional Models, and Special Circumstances Midterm Exam 2	Midterm Exam 2 – Part I (November 11) Midterm Exam 2 – Part II (November 12)
November 15	Littlefield Technologies simulation (Round 2, optional) starts: November 16 Module 7 - Decision Analysis	M7 - Homework #8 (due Dec. 02)
November 22	Thanksgiving Holiday - No Class	
November 29	Littlefield Technologies simulation ends (November 30) Zoom Meeting: December 02 Littlefield Technologies simulation/Project presentations Project advising session	Simulation Report (due Dec. 04)
December 06	Project final report – Advising session (online)	Project Final Report (due Dec. 13) Peer Evaluation and Participation (due Dec. 13)