VT VIRGINIA TECH.

BIT 2406: Business Statistics, Analytics, and Modelling
Fall 2021 (CRN: 81704)

Meeting Times & Location

10:10 AM – 11:00 AM on Monday, Wednesday, Friday @ DER 3081

Instructor

Name: Derya Ipek (Ee-pak) Eroglu (Pronouns: she/her/hers)
Office: 2004 Pamplin Hall (shared office)
E-Mail: deryaipek@vt.edu
Office Hours: TBD (Zoom) & by appointment (Zoom or in-person)

Course Description

This course includes various quantitative techniques used to solve decision-making problems that confront and confound managers from a wide variety of sectors. Due to having different characteristics, these problems fall under different categories, each with different solution approaches. Management Science, also referred to as Operations Research and Decision Science, is a discipline that includes an umbrella of mathematical techniques. These topics include but are not limited to Linear Programming, Network Modelling, Multi-Criteria Decision Making, Sensitivity Analysis, and Forecasting.

Learning Objectives (non-exhaustive)

1. Have an understanding about Management Science Approach to Problem Solving and Business Analytics
2. Solve Linear Programming Problems with two variables graphically
3. Solve Mathematical Models using Excel and performing Sensitivity Analysis
4. Formulate and solve Integer Programming models using algorithms or Excel
5. Formulate and solve Transportation, Assignment, and Network models
6. Develop Project Management models and solve them using algorithms
7. Learn how to perform decision making under multiple objectives
8. Build Forecasting models using time series analysis and regression

Prerequisite Courses

MATH 1525, MATH 1526 (or equivalent courses), and BIT 2405 with a grade of C– or better

Required Textbook

Introduction to Management Science, 13th Edition, by Bernard W. Taylor III, ISBN: 978-0-13-473066-0, Pearson Prentice Hall. (I do not recommend different versions and editions as they might have differences, especially in questions.)

Course Web Page

Course Canvas page will be used for course materials, quizzes/exams, discussion of questions, and grades.

Course Communication

Students are responsible for checking announcements and e-mails regularly. I recommend that you turn on your notifications for Canvas announcements and check your e-mails daily.

E-mail: Feel free to contact me (the instructor) for any questions or problems you face. I am here to help you. For me to answer your e-mails quickly, make sure that you include the course name in the subject line as in the example below:

From: johndoe@vt.edu
To: deryaipek@vt.edu
Subject: BIT 2406: Meeting Request
Body: Hello Ipek,
[rest of the email]

Class Material

Class material will be shared in PowerPoint and PDF format for your convenience. Class material will have "blank" sections which students will infill during class when I deliver the lecture. Because the best way to learn (especially mathematics) is by writing, I strongly encourage you to fill in the blanks with me during the class. You may want to print the notes or annotate on the files using a pdf annotator on a tablet. I use Adobe Acrobat and Goodnotes for pdf annotations for iPad. To find the best annotator for you, you may want to (Google) search the best annotator apps for your device/operating system. Zoom recordings of the class will be available on Canvas.

Honor Code

All work for your quizzes and exams is to be done on an individual basis. You are not to receive assistance from other students or persons in completing your assignments or during exams. All university policies regarding cheating, plagiarism, and falsification will be strictly applied and enforced in this course. Any student who submits any course work (completed in or outside of the classroom), including but not limited to exams, quizzes, homework, class exercises, or attendance records on behalf of another student, will be reported to the Virginia Tech Undergraduate Honor Court. Virginia Tech honor system will be in effect at all times (For details, see: https://www.honorsystem.vt.edu). Students enrolled in this course are responsible for abiding by the Honor Code:
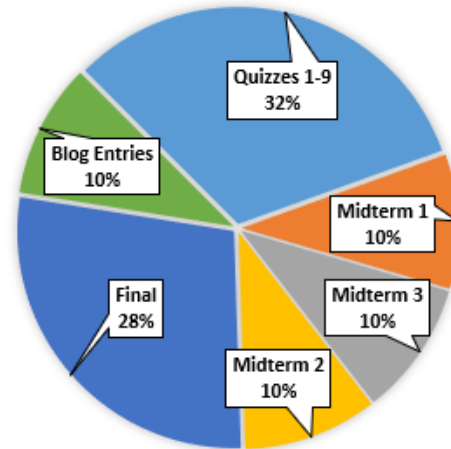
"As a Hokie, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."

I encourage you to complete the Academic Integrity Success Module **for extra credit**. It may be found at this link: https://canvas.vt.edu/enroll/CE7YK9

Grading

Grading scale and distribution for this course are provided below.

A	≥93	C	73.00 – 76.99
A-	90.00 – 92.99	C-	70.00 – 72.99
B+	87.00 – 89.99	D+	65.00 – 69.99
B	83.00 – 86.99	D	60.00 – 64.99
B-	80.00 – 82.99	D-	55.00 – 59.99
C+	77.00 – 79.99	F	≤54.99

Quizzes

When we finish a topic, a 1 hour quiz (duration is approximate) will be held the following week to make sure that you keep up with the learning material. Quizzes will be held on Wednesday evenings (time will be determined in the first week of the class). Each quiz will be 4 points. The quizzes will be conducted on Canvas with Respondus Lockdown Browser. Quizzes will be available only during designated time intervals set by the Instructor. Each quiz is worth 4 points, and your eight (8) highest grades will be included in your overall grade. For example, if you miss one quiz and if you earn 4s on the remaining eight (8) quizzes, you will collect the full 32 points from the quizzes. (Missed quizzes will be counted as 0 in all circumstances.)

Midterms and the Final

The exams will primarily consist of multiple-choice questions. The midterms and finals will be held in class using Canvas Respondus Lockdown Browser. You may use a basic calculator. More detail about the midterms and the final will be available in the following weeks.

Blog Entries

Management Science is beneficial not only for organizations but also for our lives. It is a paradigm of thinking that can make you work smart and manage your tasks effectively. The blog entries aim to make you think of the potential ways you can use the Management Science paradigm in your everyday life. Therefore, you will be asked to write a short blog entry which can be around 200-400 words, depending on your preference. The blog themes will be announced in the following weeks.

Homework

Homework questions will be assigned to you so that you may prepare for quizzes and tests with real problem-solving and hands-on experience. Homeworks will NOT be graded, and solutions will be provided. You are welcomed and encouraged to solve the homework questions and to stop by the office hours to ask your questions.

Class Schedule

Week	Week Start Date	Topic Name	Chapters	Quiz*	Blog
1	8/23/2021	Introduction	1		
2	8/30/2021	Linear Programming	2, 3, 4	Quiz #1	Blog #1
3	9/6/2021			Quiz #2	
4	9/13/2021				
5	9/20/2021			Quiz #3	
6	9/27/2021	Midterm* #1			
7	10/4/2021	Integer Programming	5	Quiz #4	Blog #2
8	10/11/2021	Transportation, Transshipment, and Assignment	6	Quiz #5	
9	10/18/2021	Network Flow Models	7	Quiz #6	
10	10/25/2021	Midterm* #2			Blog #3
11	11/1/2021	Project Management, Multi-Criteria Decision Making	8,10	Quiz #7	
12	11/8/2021	Multi-Criteria Decision Making, Decision Analysis	10,12	Quiz #8	Blog #4
13	11/15/2021	Midterm* #3			
14	11/22/2021	Thanksgiving Break (No Class)			
15	11/29/2021	Forecasting	15		
16	12/6/2021	Review		Quiz #9	Blog #5

*Quizzes and Midterm exams will be held on Wednesdays.

Classroom Etiquette

Thoughtfully and critically engaging with colleagues is a skill that will benefit you in all facets of life. Therefore, you are encouraged to utilize this course (and other courses) to refine such interpersonal communication abilities. Dialogue (verbal, written, or otherwise) is a critical component of academia, industry, and society, in general. Knowing how to critically and respectfully discuss complicated (and often controversial) ideas is something all academics (among others) should be readily able to do. You will not always agree with your colleagues' perspectives. Nevertheless, it is important to be able to thoughtfully and thoroughly explain why and how you disagree. Moreover, in the event that yours is the perspective in debate, it is equally important to be able to thoroughly explain why you hold such a perspective.

For this course, all dialogue should effectively incorporate reading materials (those already in the course site or others added to the conversation during discussion) and other resources. Simply stating that you disagree is insufficient. Be (constructively) critical. Be thought-provoking. Be challenging. Be helpful. Be nice.

Our classroom is a safe place where you should feel free to express yourself; however, oppressive language and/or behavior will not be tolerated. I am committed to creating a more diverse and inclusive environment for everyone. If you feel offended or uneasy about anything that is said in class, I encourage and welcome you to talk to me when you are comfortable doing so.

Principles of Community

Virginia Tech is a public land-grant university, committed to teaching and learning, research, and outreach to the Commonwealth of Virginia, the nation, and the world community. Learning from the experiences that shape Virginia Tech as an institution, we acknowledge those aspects of our legacy that reflected bias and exclusion. Therefore, we adopt and practice the following principles as fundamental to our ongoing efforts to increase access and inclusion and to create a community that nurtures learning and growth for all of its members:

- We affirm the inherent dignity and value of every person and strive to maintain a climate for work and learning based on mutual respect and understanding.
- We affirm the right of each person to express thoughts and opinions freely. We encourage open expression within a climate of civility, sensitivity, and mutual respect.
- We affirm the value of human diversity because it enriches our lives and the University. We acknowledge and respect our differences while affirming our common humanity.
- We reject all forms of prejudice and discrimination, including those based on age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, and veteran status. We take individual and collective responsibility for helping to eliminate bias and discrimination and for increasing our own understanding of these issues through education, training, and interaction with others.
- We pledge our collective commitment to these principles in the spirit of the Virginia Tech motto of Ut Prosim (That I May Serve).

Special Needs

Students who need to make arrangements for special learning abilities or situations should make an appointment to talk with me as soon as possible. I am dedicated to providing a productive learning environment for ALL students. Reasonable accommodations are available for students that require them. To be eligible for such accommodations, students should contact Services for Students with Disabilities (SSD, 310 Lavery Hall, www.ssd.vt.edu), via telephone 540-231-3788 (voice) or 540-213-1740 (TTY). If you need adaptations or accommodations, please contact me. It is my priority to make sure you are comfortable and feel safe in the learning environment.

Disclaimer

Due to the pandemic, we have been through three semesters that are not like any previous semesters. COVID-19 is not yet over, and policymakers are trying to think of the best for society by changing the rules and guidelines. We are in this together, and we will get through this. As the instructor, I am dedicated to ensuring that potential changes during the semester (like going virtual) will have minimal effect on the learning experience. I hereby declare that the plans provided in this syllabus (schedule and grading) are subject to change to ensure feasibility and fairness. However, sufficient notification of any such changes will be clearly communicated in advance.