OPRE 3333
Quantitative Business Analysis

Course Information:

Course Number/Section:	OPRE 3333.002
Course Title:	Quantitative Business Analysis
Term:	Fall 2024
Lecture Time:	Monday-Wednesday 11:30AM-12:45PM
Location:	JSOM1.107

Instructor:	**Nesli Oguzman**
Office Information:	Online via TEAMS by appointment
Email:	neslihan.oguzman@UTDallas.edu

Course Pre-requisites, Co-requisites and/or Other Restrictions:
Credit cannot be received for both courses, OPRE 3333 and MATH 2333.
Prerequisites: MATH 1325 or MATH 2413 or MATH 2417

Course Description:
Provides students with the analytical tools necessary for making better management decisions. Students are introduced to mathematical techniques used to make different types of business decisions.

Student Learning Objectives/Outcomes:
Students are required to take the initiative to learn, understand and apply quantitative business analytics to real-world business data. At the end of this course, you should:

- Be able to apply mathematical techniques of optimization and linear algebra
- Be able to effectively understand and interpret analytic models and use them in the decision-making process
- Be able to utilize basic business analytic tools in Excel

Textbooks:

It is advised that the student purchase Cengage unlimited (*It is available in different durations, depending on the previous classes taken you might still have access to the platform*) to gain access to both WebAssign and MindTap platforms to complete the required homework assignments and read the ebook.

1. Elementary Linear Algebra - 8th edition
   - Author: Larson
   - Ebook ISBN: 9780357539538 Homework Platform WebAssign
2. Business Analytics – 4th edition
   - Authors: Camm/Cochran/Fry/Ohlmann/Anderson/Sweeney/Williams
   - Ebook ISBN: 9780357708385 Homework Platform Mindtap

Grading Criteria:
Grades are assigned based on the following weighting.

Homework average	25%
Introduction assignment	1%
Test Average	74%

The letter grades are determined based on the following grading scheme.

96.5-100 A^+	86.5-89.4 B^+	76.5-79.4 C^+	66.5-69.4 D^+	Below 59.5 F
93.5-96.4 A	83.5-86.4 B	73.5-76.4 C	63.5-66.4 D	
89.5-93.4 A^-	79.5-83.4 B^-	69.5-73.4 C^-	59.5-63.4 D^-	

Software:
This course uses Microsoft Excel .You can download and install Excel for free as a UTD student using the link https://www.utdallas.edu/oit/o365/.

The Statistics and Math lab:
This lab, which is located in room JSOM 2.414, offers assistance to students enrolled in OPRE 3333, OPRE 3340 or OPRE 3360. The schedule is to be announced on eLearning.

Exams:

- Exams will be administered by the Testing Center. Students should visit https://ets.utdallas.edu/testing-center to register for a seat and for more information.
- The exams are not cumulative, and will be given at the testing Center. You will have a window of two days to take the exam . For the exams that are scheduled at the testing center students.MUST reserve a seat NO LATER THAN 72 HOURS prior to exam time at Testing Center. If you don't register and ask for a make up exam, it will not be granted.

- Exams will be available to students for review after all the exams have been graded.
- There will be NO make-up for any missed exam except for medical emergencies in which a written statement is required to justify the situation along with the physician's address and phone number.

Assignments:

- The assignments will be given on WebAssign (for the 1st test) and on MindTap (for the 2nd and 3rd test).

- **Extra Credit:**
  - Extra credit will NOT be offered.

Course Policy:

- **General:**
    - It is your responsibility to read the syllabus and check the eLearning for announcements/changes daily.
    - You must pay close attention to all the due dates from the first day of class and schedule your personal activities around those dates.
    - For any grade posted on eLearning, you have one week after it is posted to request for regrading.
    - Please wait for the first day lecture to get the cengage registration.
    - This is a face to face class and students should arrange their time accordingly.
    - Attendance will be taken until census date September 4th 2024
    - Class begins on time. Please maintain class decorum and be respectful towards fellow students in the class. If you have a doubt or misunderstanding regarding course work feel free to discuss it with me.
    - Use of your computer is allowed as long as it is not interrupting the class or distracting other students in the classroom.. Given that this is a numeric class, the material discussed will need for you to take notes in a conventional way most of the time. Therefore, I encourage you to use your computer wisely. **In my experience, abusing the use of computers during class time results in unsatisfactory final grades.**

- **Academic Dishonesty/Cheating:**
    - Students are required to read, understand and abide by the university policy on academic honesty.
    - Any student found responsible for committing an act of academic dishonesty will receive a grade of zero on that exam or assignment.
    - The instructor reserves the right to change the grading policy without any notice due to unforeseen circumstances such as dishonesty, cheating, etc.

- **Mobile Phones, Laptops & Electronic Devices:**
    - Taking unauthorized pictures or recording during the lecture/classroom from presented materials with a mobile phone, laptop, camera or any other device is an infringement of privacy rights and is prohibited

Technical Support:

If you experience any issues with your UT Dallas account, contact the UT Dallas Office of Information Technology Help Desk via e-mail at assist@utdallas.edu or via telephone at 972-883-2911. UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The services include a toll-free telephone number for immediate assistance (1-866-588-3192), email request service at elearning@utdallas.edu, and an online chat service. Please use this link to access the UTD eLearning Helpdesk: https://ets.utdallas.edu/elearning/helpdesk.

- **Class Recordings:** Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

- **Class Materials:** Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

- **Comet Creed:**
- This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

    - ***As a Comet, I pledge honesty, integrity, and service in all that I do.***

- **Academic Support Resources:**
- The information contained in the following link lists the University's academic support resources for all students. Please go to Academic Support Resources webpage for these policies.

- **UT Dallas Syllabus Policies and Procedures:**
- The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class. Please go to UT Dallas Syllabus Policies webpage for these policies

TENTATIVE CALENDAR &ASSIGNMENTS

08/19/2024 – 12/05/2024

Subject to change

Week	Materials to be Covered
Week 1 08/19 - 08/21	**Larson Book** – Linear Equations in *n* Variables – Solutions and Solution Sets – Systems of Linear Equations – The substitution method
Week 2 08/26 – 08/28	– Matrices – Row-Echelon Form and Reduced Row-Echelon Form – Elementary Row Operations and Equivalent Systems – Gaussian Elimination with Back-Substitution – Equality of Matrices – Matrix Addition, Subtraction, and Scalar Multiplication – Matrix Multiplication – Systems of Linear Equations ($AX = B$)
Week 3 09/02– 09/04	**Census Day 09/04 (Last Day to withdraw without a W)** **Labor Day 09/02 No Class** – Properties of Matrix Multiplication (noncommutativity of matrix multiplication) – Properties of the Identity Matrix – The Transpose of a Matrix
Week 4 09/09– 09/11	– Matrices and Their Inverses – Properties of Inverses – Systems of Equations ($X = A^{-1}b$) – The Determinant of a 2 X 2 Matrix – Minors and Cofactors – The Determinant of a Square Matrix (Expansion by Cofactors) – The Determinant of a Matrix of Order 3 (copy-paste) – Triangular Matrices
Week 5 09/16- 09/18	– The Effect of Elementary Row Operations on Determinant – Finding a Determinant Using Elementary Row Operations

	– Matrix Products and Scalar Multiples – Determinants and the Inverse of a Matrix – Determinants and the Transpose of a Matrix – The Adjoint of a Matrix – Cramer's Rule
Week 6 09/23 – 09/25	**Test 1 Review (Chapters 1,2,3 Larson book)** **Test 1 (opens 09/26 and ends 09/28)**
Week 7 09/30 – 10/02	Introduction to Business Analytics- Chapter 1 Camm book Business Analytics Defined – Descriptive Analytics – Predictive Analytics – Prescriptive Analytics Data Visualization-Chapter 3 Camm book – Crosstabulation – PivotTables in Excel – Scatter Charts – Line Charts – Bar/Column/Pie Charts – Bubble Charts – Heat Maps – Clustered/Stacked Column/Bar Charts
Week 8 10/07 – 10/09	Time series analysis and forecasting– Chapter 8 Camm book – Horizontal Pattern – Trend Pattern – Seasonal Pattern – Trend and Seasonal Pattern – Forecast Accuracy – Moving Averages and Exponential Smoothing – Linear Trend Projection – Seasonality Without Trend – Seasonality with Trend – Using Regression Analysis as a Causal Forecasting Method

Week 9 10/14 –10/16	Linear Optimization Models – Chapter 12 Camm book Linear optimization graphical solutions-practice in class. Bring graph paper and ruler - The Geometry of Linear Optimization (feasible region, extreme points, objective function contour)
Week 10 10/21 – 10/23	**Test 2 Review (Chapters 1,3,8 and 12 (graph solutions only) Camm book)**
Week 11 10/28 – 10/30	**Test 2 (opens 10/28 and ends 10/30) NO CLASS**
Week 12 11/04 – 11/06	Linear programming using Excel Solver, please bring laptops to class. – Alternative Optimal Solutions – Infeasibility – Unbounded – Interpreting Excel Solver Sensitivity Report
Week 13 11/11 – 11/13	- Chapter 13 Camm Book - Types of Integer Linear Optimization Models (all-integer, binary, mixed) - Problem Formulation - The Geometry of Linear All-Integer Optimization (LP relaxation, convex hull) - Solving Integer Optimization Problems with Excel Solver
Week 14 11/18 – 11/20	Nonlinear Optimization Models Chapter 14 Camm Book - Solving Nonlinear Optimization Models Using Excel Solver
Week 15 11/18 – 11/20	Chapter 15 Camm Book – Payoff Tables, Decision Trees – Optimistic Approach. Conservative Approach, Minimax Approach – Expected Value Approach
Week 16 11/25 – 11/27	**Thanksgiving Week**
Week 17 12/02-12/04	**Third Test (Chapters 12,13,14,15 of Camm Book)** **Opens December 9th closes December 10th**

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor