Syllabus:

MATH:1350:0AAA - Quantitative Reasoning for Business Fall 2020

College of Liberal Arts and Sciences, Department of Mathematics

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Instructor: Muthu Krishnamurthy

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Office hours: Tue: 2.30-3.30p, **Wed**: 10.30-11.30a**, Thu** 2.30-3.30p **via Zoom:** *https://uiowa.zoom.us/j/2544103750*
(This may change during the first/second week of classes depending on my schedule. I will notify you all of any change to my office hours.)

DEO Contact Information: Professor Weimin Han, 14 MLH, weimin-*han@uiowa.edu*

Lectures:

MATH:1350:0AAA: Tuesday and Thursday 12:30 - 1:45 PM (Real time instruction via Zoom.) Certain lectures may be recorded in advance which then will be combined with real-time problem solving sessions.) The zoom link will be available through ICON.

Discussion Sections and Teaching Assistants:

There are a total of 31 discussion sections for this course. Each discussion section is led by a teaching assistant (TA) and is held twice a week on **Monday/Wednesday**. You must be enrolled in one (and only one) of the discussion sections. The time and place of your TA's office hours and math tutorial lab hours will be announced by your TA. The discussion sections are useful for questions and problem solving. The TA for your discussion section will be able to handle most of your routine questions.

Description of the Course:

This course includes algebraic techniques and modeling, together with quantitative methods for treating problems that arise in management and economic sciences. This course is intended for those planning to major in business. Topics include algebra techniques, functions and functional models, exponential and logarithmic functions and models, and a thorough introduction to differential calculus. Examples and applications are from management, economic sciences, and related areas.

Approved GE (General Education Program):

This course is approved to satisfy the Quantitative or Formal Reasoning requirement.

Objectives and Goals of the Course:

To learn algebraic techniques and modeling, together with quantitative methods for treating problems that arise in management and economic sciences.

Prerequisites:

ALEKS score of 55 or higher or MATH:1005 with a minimum grade of C-

Required Text

Lial, Hungerford, Holcomb, & Mullins: *Mathematics with Applications in the Management, Natural, and Social Sciences, 12th Edition***.** This is available as e-text through MyLab in ICON for all registered students.

Topics to be covered: (from textbook)

- Review of Chapter 1: Algebra and Equations.
- Chapter 2: Graphs, lines and inequalities.
- Chapter 3: Functions and graphs.
- Chapter 4: Exponential and logarithmic functions.
- Chapter 5 (5.1, 5.2): Simple interest and compound interest.
- Chapter 11: Differential Calculus
- Chapter 12 (12.1,12.2,12.3): Local extrema, second derivatives and optimization.

Weekly Schedule with core problems:

Week 1, Tuesday **In Lecture:** Review Chapter 1 • Real numbers and polynomials (Sections 1.1, 1.2) • Factoring and rational expressions (Sections 1.3 and 1.4) • Exponents and radicals (Section 1.5)	**Week 1 Thursday** **In Lecture:** Review Chapter 1 • First degree equations (Section 1.6) • Quadratic equations (Section 1.7) • Applied problems (Sections 1.6 and 1.7)

Week 2, Tuesday **In Lecture:** • Graphs (Section 2.1) • Equations of lines (Section 2.2)	**Week 2, Thursday** **In Lecture:** • Equation of lines (Section 2.2) • Linear models (Section 2.3)

Week 3, Tuesday **In Lecture:** • Linear inequalities (Section 2.4) • Polynomial and rational inequalities (Section 2.5)	**Week 3, Thursday** **In Lecture:** • Functions (Section 3.1) • Graphs of functions (Section 3.2)

Week 4, Tuesday **In Lecture:** • Applications of linear functions (Section 3.3)	**Week 4, Thursday** **In Lecture:** • Quadratic functions and applications (Section 3.4)

Week 5, Tuesday **In Lecture:** • Exam 1 (Sections 1.1-1.7, 2.1-2.5, 3.1-3.4)	**Week 5, Thursday** **In Lecture:** • Polynomial functions (Section 3.5) • Rational functions (Section 3.6)

Week 6, Tuesday **In Lecture:** • Rational functions (Section 3.6)	**Week 6, Thursday** **In Lecture:** • Exponential functions (Section 4.1)
Week 7, Tuesday **In Lecture:** • Applications of exponential functions (Section 4.2) • Logarithmic functions (Section 4.3)	**Week 7, Thursday** **In Lecture:** • Logarithmic functions (Section 4.3)
Week 8, Tuesday **In Lecture:** • Logarithmic and exponential equations (Section 4.4)	**Week 8, Thursday** **In Lecture:** • Simple interest and discount (Section 5.1) • Compound interest (Section 5.2)
Week 9, Tuesday **In Lecture:** • Limits (Section 11.1)	**Week 9, Thursday** **In Lecture:** • Rates of change (Section 11.3)
Week 10, Tuesday **In Lecture:** • Exam 2 (Sections 3.5,3.6, 4.1-4.4, 5.1,5.2,11.1,11.3)	**Week 10, Thursday** **In Lecture:** • Tangent lines and derivatives (Section 11.4) • Techniques for finding derivatives (Section 11.5)
Week 11, Tuesday **In Lecture:** • Techniques for finding derivatives (Section 11.5)	**Week 11, Thursday** **In Lecture:** • Derivatives of products and quotients (Section 11.6)
Week 12, Tuesday **In Lecture:** • Chain rule (Section 11.7)	**Week 12, Thursday** **In Lecture:** • Derivatives of exponential and logarithmic functions (Section 11.8)
Week 13, Tuesday **In Lecture:** • Continuity and differentiability (Section 11.9) • Local extrema (Section 12.1) • Group based activity (Case Study 11 of Chapter 11) in discussion class	**Week 13, Thursday** **In Lecture** • Local extrema (Section 12.1)
Week 14, Tuesday **Thanksgiving break**	**Week 14, Thursday** **Thanksgiving break**

Week 15, Tuesday **In Lecture:** • Second derivative (Section 12.2)	**Week 15, Thursday** **In Lecture:** • Optimization (Section 12.3)
Week 16, Tuesday **In Lecture:** • Review for final exam	**Week 16, Thursday** **In Lecture:** • Review for final exam

Core Problems: The core problems indicate the kind of basic problems you will need to be able to solve by hand. They also provide a guide to the basic level of difficulty to be expected on the homework, quizzes and exams.

Section 1.1	17,19,27,35,47-50,53,54,61-64,79,80
Section 1.2	13,21,22,31-36,39,40
Section 1.3	9,10,21-24,33-36,53,54,59-62
Section 1.4	9-14,25-28,42-45,47-49,57-59
Section 1.5	3-8, 11-17, 31,32,35,37,41,43,45,47,49,51,65,69,71,73,75
Section 1.6	1-18, 25, 27, 29, 35, 37, 39, 43, 49, 53, 57.
Section 1.7	7, 8, 15-20, 21-24, 33-38, 39, 41, 47, 49, 53, 55. (Applied problems): 59-67
Section 2.1	3-6, 7-12, 13-15, 21-26, 31, 33, 35, 41, 43, 47, 49, 51, 53-60.
Section 2.2	5-8, 11, 13, 19-23, 29, 31, 35, 37, 41, 45, 49, 51, 59-62, 63, 65, 66, 67, 69, 71, 73, 77- 80.
Section 2.3	5-8,11,12.
Section 2.4	13-26, 31, 33, 35, 39-46, 51-55.
Section 2.5	5-12, 13-20, 29-37, 41-44.
Section 3.1	1, 3, 5-10, 17-22, 29-34, 37, 39, 41, 43, 45, 47-52.
Section 3.2	5-10, 17, 19, 23-26, 27-32, 37- 40, 41, 43, 45, 46.
Section 3.3	5-8, 9-12, 13-16, 17, 19, 20, 21, 33, 35, 37, 39, 47, 48, 50, 51, 52.
Section 3.4	1-4, 5-8, 9-16, 17, 19, 21, 23, 25, 27, 29, 31, 33, 34, 41, 42, 43, 45, 47, 49, 53-55, 59-61.
Section 3.5	1, 3, 5-8, 9-14, 15-20, 21-26.
Section 3.6	1-12, 13-16, 17-20, 21-22, 23-28.
Group Activity I	Case study 3 of Chapter 3
Section 4.1	13-18, 19, 20, 21-26, 27, 28, 29, 30, 35, 36, 37, 38, 39, 42, 43, 46, 47.
Section 4.2	1-8, 9, 12, 13, 14, 17, 18.
Section 4.3	5-24, 25-28, 30-41, 43-46, 47-50, 53- 54, 60, 61-63, 65-67, 69, 70.
Section 4.4	1-20, 23-60, 63-66, 69-74.
Section 5.1	2-7, 11-20, 23-26, 27-34, 35-46.
Section 5.2	7-20, 25-27.

Section 11.1	3-8, 21-30, 31-51.

Section 11.3	1-8, 11-14, 19-24, 25-30, 31- 34.
Section 11.4	1-8, 15-20, 27-31.
Section 11.5	1-30, 31-44,45-53,55-58,59-66,71-74
Section 11.6	5-10, 11-14, 17-22, 25, 27, 31- 34, 35-38.
Section 11.7	1, 3, 9-12, 17-20, 21-34, 49- 52, 55, 57-61, 69-72.
Section 11.8	9-16, 19-22, 39-42, 53-56, 59, 60, 66, 67.
Section 11.9	1-8, 13-16, 21-26, 29, 32.
Section 12.1	3-6, 13-18, 19-22, 29-32, 33-38, 48-52, 56, 58.
Group Activity II	Case study 11 of Chapter 11
Section 12.2	15-18, 21-22, 27-30, 29-48, 49, 50, 57-58, 61-62.
Section 12.3	3-6, 7-12, 17-18, 27-34, 51-54.

Getting help:

You are very welcome to see your course instructor or your TA during their office hours or to make an appointment. Please take advantage of the help offered to you and come to office hours early if you feel you have problems following the course. Don't wait until the last minute before the exams.

THE MATHEMATICS TUTORIAL LAB, 125 MLH (MacLean Hall):

The Math Lab is a **free drop-in** tutorial service staffed by Teaching Assistants from the Department of Mathematics. Check out the web page https://math.uiowa.edu/math-tutorial-lab for hours. Regular Math Lab hours will start in the second week of classes. Your TA and other course TAs will be available at various times in the Math Lab. The Lab provides one of the best ways of getting personalized help. Practice exams and quizzes are also available in the Lab. From time to time tutorials on special topics may be offered as well. It is strongly recommended that you make use of this service.

Supplemental Instruction (SI) for Quantitative Reasoning for Business: This is an additional resource for students

Quantitative Reasoning for Business	Mondays 4:30-5:20 PM
Emily Yeomans	Wednesdays 1:30-2:20 PM
	Thursdays 3:00-3:50 PM

The link for students to sign into the Quantitative Reasoning for Business SI sessions is: https://apps.its.uiowa.edu/swipe2/site/arc/signin/virtual/quantreasbusiness

Here is the pitch video by Emily: The pitch video for students is this link: https://mediaspace.uiowa.edu/media/Emily%2C+Quantitative+Reasoning+for+Business%2C+SI+Pitch+Video/0_ybb9uk2c

Lectures

The lectures for this course will be pre-recorded and made available through **UICapture**. You can find the link to UICapture on course navigation panel on the left in the ICON page of this course. Every lecture will be recorded in three parts each of approximately 15 minutes in length. The video for a particular lecture will be made available a day in advance to the lecture period, if not earlier. Students will be awarded participation points based on so-called "participation questions" embedded within each video. If a video doesn't contain such a question, then participation will be evaluated based on time spent on the video. I will be available on Zoom during the regular lecture hour to answer any questions. In addition to the participation questions, there will be problems in these videos designed to enhance your understanding of the material. Students are strongly encouraged to work on these problems; it will generate topics/questions that may be discussed live on Zoom.

How to make attending lectures efficient:

Before watching a lecture video, read the introduction and the first few examples of the section(s) that are covered in the lecture. After watching each lecture, review your lecture notes, read the corresponding sections of the book and solve related homework problems. If there are any questions with the video lectures, get live on Zoom with your instructor.

For each lecture, you are expected to spend at least two hours of study on reading and solving related homework problems. Additional time will be needed for quiz and exam preparation. Keep in mind that this course carries four hours credit.

Lecture Attendance/Participation:

You are not required to be live on Zoom while watching the recorded video lectures. However, it is absolutely essential that you watch these lectures in a timely manner. In order to get the participation points, you are required that you answer the participation questions (this will encourage you to watch the video lectures) by 5p on Friday of the corresponding week.

Group-based Activities:

There will be 1-2 group-based activities led by the teaching assistants in the discussion sections. The first group-based activity will be a case-study on maximizing profit. This will be discussed in the discussion sessions on Wednesday of week 6. The second group-based activity will be a case-study on price elasticity of demand. This will be discussed in the discussion sessions on Wednesday of week 13. Your TA will discuss the details of these group-based activities with you ahead of time.

MyLab Assignments:

Doing problems is crucial to learning Mathematics! Homework will be assigned and collected through **MyLab and Mastering**, an online tutorial and homework program by Pearson that also contains the textbook as an eBook. **You need to activate MyLab and Mastering by enrolling in the MyLab Course linked to the ICON site for this course.**

Quizzes:

Starting the second week of quizzes, there will be a **closed book** short quiz (20min) administered via MyLab every Wednesday, with the exception of the exam days and the days of group-based activities. Contact your TA for more information on quizzes.

Exams:

There will be two midterm exams and a 2-hour final exam, the latter will be cumulative. All exams will be ~~multiple choice~~. (*Due to limitations imposed by MyLab, exams will be mostly* ***multiple choice*** *with* ***few fill in the blank*** *question*.)

Midterm Exam 1: Tuesday, September 22, during the lecture hour.

Midterm Exam 2: Tuesday, October 27, during the lecture hour.

Final Exam: The final examination date and time will be announced by the Registrar generally by the fifth week of classes. The final examination date and time for this course will be announced in class and at the course ICON site once it is known. **Do not make your end of the semester travel plans until the final exam schedule is made public.**

Collaboration:

The 1-2 **group-based activities** will be done in small groups during discussion section sessions. You will be introduced to the broad topics of these activities during the lectures. You will then form small groups in the discussion sections to learn more about these topics and to complete the projects. The focus of these projects will be on team learning and peer teaching and on using the tools learned in the course in a non-exam based environment.

The **MyLab Assignments** for this course are designed to help you master your knowledge related to the topics covered during the lectures. As such, you may work on these assignments with others, but **each student has to submit his/her own solutions to the MyLab Assignments**. However, please be aware that to master the skills needed for this class, practice is required and that to do well on the quizzes and exams you will need to work lots of problems multiple times without help. Be sure to test your knowledge by doing as much of the assignments as possible on your own.

There is ABSOLUTELY NO collaboration allowed on quizzes and exams. Any sign of collaboration or sharing of answers will be considered academic misconduct and reported to the College.

Calculators and other electronic devices: No calculators or other electronic devices will be allowed during exams or quizzes.

Grades:

Grades will be assigned using a point system. The **maximal possible overall score for this course will be 1000 points** which are distributed as follows:
100 points -- Lecture Participation, Group-based Activities, Online Homework (10%)
100 points -- Quizzes (10%)
250 points -- Midterm Exam 1 (25%)
250 points -- Midterm Exam 2 (25%)
300 points -- Final Exam (cumulative) (30%)

The lowest quiz and homework scores will be dropped. There will be **no make-up** homework or quizzes unless there is a valid and verifiable reason.

Overall course grades will be assigned using the following rubric:860 points or higher: A grades (A- or A); 760 points or higher: B grades (B- or B or B+); 620 points or higher: C grades (C- or C or C+); 520 points or higher: D grades (D- or D or D+).

Any adjustments to this rubric will be announced by your instructor during the lecture.
A plus/minus grading system will be used for your overall course grade (e.g., you can earn a course grade of B+ or B or B- instead of just a grade of B). The precise cut off scores for these more refined grades will be announced after Midterm Exam 2. There will be no A+ grade awarded in this course. The content and schedule of the syllabus is subject to possible changes during the semester but I will inform you all of any such changes.

Pearson

Student Registration Instructions
MyLab & Modified Mastering with Canvas

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Please Read FIRST:

Your course materials will be billed directly to your University Account through the option called **ICON DIRECT**. This means you do NOT have to purchase materials outside of this set up and your UBill will be auto charged and the lowest possible price for students.

Enter Your ICON Course:

Sign in to and enter your **ICON course.**

Do the following:

- Select **the MyLab & Mastering** in the Course Navigation, and then select any course link on the Pearson page.

Get Access to Your Pearson Course Content:

1. Enter your Pearson account **username** and **password** to **Link Accounts**.
   You have an account if you have ever used a Pearson MyLab & Mastering product, such as MyMathLab, MyITLab, MySpanishLab, MasteringBiology or MasteringPhysics.
   - If you don't have a Pearson account, select **Create** and follow the instructions.
   - Enter access code: **WMLHME-STEAD-POUCH-BOITE-JABOT-PIPES**
   - From the You're Done page, select **Go to My Courses**.

Note: We recommend you always enter your MyLab or Mastering course through ICON.

Get Your Computer Ready

For the best experience, check the system requirements for your product at:
http://www.pearsonmylabandmastering.com/system-requirements/

Need help?

For help with MyLab & Modified Mastering with ICON, go to:
http://help.pearsoncmg.com/mylabmastering/canvas/student/en/index.html

24/7 TECH SUPPORT

https://support.pearson.com/getsupport/s/

UI and the College of Liberal Arts and Sciences

INFORMATION FOR UNDERGRADUATES

Absences and Attendance

Students are responsible for attending class and for contributing to the learning environment of a course. Students are also responsible for knowing their course absence policies, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, including Holy Day obligations, military service obligations, unavoidable circumstances or University authorized activities Students may use the CLAS absence form to aid communication with the instructor who will decide if the absence is excused or unexcused. The form is on ICON in the top banner under "Student Tools." More information is at https://clas.uiowa.edu/students/handbook/attendance-absences.

Academic Integrity

All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through UI email. Visit this page for information: (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

Accommodations for Disabilities

UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student is then responsible for discussing specific accommodations with the instructor. More information is at https://sds.studentlife.uiowa.edu/.

Administrative Home of the Course

The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and related policies. Other colleges may have different policies. CLAS policies may be found here: https://clas.uiowa.edu/students/handbook.

Class Behavioral Expectations

Students are expected to comply with University policies regarding appropriate classroom behavior as outlined in the Code of Student Life. This includes the policies and procedures that

all students have agreed to regarding the Steps Forward for Fall 2020 in response to the COVID-19 pandemic. Particularly, all students are required to wear a face covering when in a UI building, including a classroom. In addition, the density of seats in classrooms has been reduced; in some instances, this will allow 6 feet or more between students while other cases, it may be less. Regardless, wearing a face covering and maintaining as much distance as possible are vital to slowing the spread of COVID- 19. In the event that a student disrupts the classroom environment through their failure to comply with the reasonable directive of an instructor or the University, the instructor has the authority to ask that the student immediately leave the space for the remainder of the class period. Additionally, the instructor is asked to report the incident to the Office of Student Accountability for the possibility of additional follow-up. Students who need a temporary alternative learning arrangement related to COVID-19 expectations should contact Student Disability Services arrangements/; +1 319 335-1462) (https://sds.studentlife.uiowa.edu/fall-2020/covid-19-temporary-learning-arrangements/.

Class Recordings: Privacy and Sharing

Some sessions of a course could be recorded or live-streamed. Such a recording or streaming will only be available to students registered for the course. These recordings are the intellectual property of the faculty, and they may not be shared or reproduced without the explicit **written** consent of the faculty member. Students may not share these sessions with those not in the class; likewise, students may not upload recordings to any other online environment. Doing so is a breach of the Code of Student Conduct and, in some cases, a violation of the Federal Education Rights and Privacy Act (FERPA).

Communication and the Required Use of UI Email

Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).

Complaints

Students with a complaint about an academic issue should first visit with the instructor or course supervisor and then with the Chair of the department or program offering the course; students may next bring the issue to the College of Liberal Arts and Sciences; see this page for more information: https://clas.uiowa.edu/students/handbook/student-rights-responsibilities.

Final Examination Policies

The final exam schedule is announced around the fifth week of classes; students are responsible for knowing the date, time, and location of a final exam. Students should not make travel plans until knowing this information. No exams of any kind are allowed the week before finals with very few exceptions made (for labs, ESL and some world language courses, and off-cycle courses): https://registrar.uiowa.edu/final-examination-scheduling-policies.

Nondiscrimination in the Classroom

The University of Iowa is committed to making the classroom a respectful and inclusive space for people of all gender, sexual, racial, religious, and other identities. Toward this goal, students are invited in MyUI to optionally share the names and pronouns they would like their instructors and advisors to use to address them. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity (https://diversity.uiowa.edu/eod; +1 319 335-0705 or (diversity.uiowa.edu).

Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, please see https://osmrc.uiowa.edu/.