

For students

This is a template syllabus. This file contains course specific information, such as catalog description, goals and objectives, which does not change. The parts highlighted in red are to be determined by the individual instructors. The official syllabus for each section will be provided by the instructor in the beginning of the semester.

***MATH 1380***

**SYLLABUS Fall 20xx**

The University of Iowa  
The College of Liberal Arts and Sciences  
Department of Mathematics

**Calculus and Matrix Algebra for Business MATH 1380: xxxx**

**Time & Location for Lecture: xxxx**

Some of the policies relating to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.

**Prerequisites:** MATH:1340 with a minimum grade of C- or MPT Level 3 score of 9 or higher or MATH:1020 with a minimum grade of C- or ALEKS score of 65 or higher or MATH:1440 with a minimum grade of C- or MATH:1005 with a minimum grade of C-

**Approved GE:** Quantitative or Formal Reasoning.

**Instructor:**

Office location and hours:

Phone:

E-mail:

Website address:

**TA:**

**Supervisor:** For this course, see the DEO.

**DEO Contact Information:** Professor ..., 14 MLH, 319-335-0714, ...@uiowa.edu

**Description of Course:**

This course includes the study of mathematical problems arising in management and economic sciences and is intended for those planning to major in business. Topics include an introduction to differential and integral calculus, linear equations, and matrices. Examples in business are used to motivate the mathematical presentations. Each week there are three lectures given by a faculty member; these are augmented by two meetings of a discussion section directed by a

TA. Requirements usually include two one-hour evening exams and a final exam, plus quizzes during discussion periods; exams usually are multiple-choice. Students are encouraged to use the Math Tutorial Laboratory for additional help.

### **Objectives and Goals of the Course:**

The objectives for a student taking MATH:1380 are to have a solid understanding of basic concepts and applications of single variable differential and integral calculus and the ability to apply those ideas to applications in business, finance, and management.

MATH:1380 begins with a review of important pre-calculus topics including basic algebra, graphs, and important functions. We begin the principal topics of the course with limits of functions, and then proceed to the definition and interpretation of the derivative of a function. The course continues with techniques for computing derivatives which will be used to compute derivatives of specific types of functions including polynomial and rational functions, algebraic functions, and especially logarithmic and exponential functions. Following this, we study higher derivatives and learn how derivatives can be applied to graphing functions and optimization problems. Examples include optimization of profit, cost, and revenue, and elasticity of demand. The course continues with the definition of the definite integral of a function, which measures accumulated change. We will study the Fundamental Theorem of Calculus, and learn some basic techniques for evaluating definite integrals. Integrals will then be applied to topics in finance and economics including revenue streams and consumer and producer surplus. The final topic for MATH:1380 is linear algebra. We study systems of linear equations and their solutions, matrices and matrix operations including matrix multiplication and matrix inverses.

**Required text:** (Check the current textbook from Department Webpage)

<https://math.uiowa.edu/undergraduate-program/course-information/book-list>

**The textbook used in 2018:** Calculus with Applications, University of Iowa Custom 11th edition, ISBN 9781323404232 Note: This University of Iowa Custom Edition consists of chapters 2-8 from Calculus with Applications, 11th edition, by Lial, Greenwell, and Ritchey and an additional chapter from Finite Mathematics with Applications In the Management, Natural, and Social Sciences by Lial, Hungerford, Holcomb and Mullins.

**Material to be covered: The Chapters are from the text above. The topics will be essentially same if the textbook changes.**

Chapter 1. Linear Functions: Slopes and Equations of Lines, Linear Functions and Applications

Chapter 2. Nonlinear Functions: Properties of Functions, Quadratic Functions, Translation and Reflection, Polynomial and Rational Functions, Exponential Functions, Logarithmic Functions

Chapter 3. The Derivative: Limits, Continuity, Rates of Change, Definition of the Derivative

Chapter 4. Calculating the Derivative: Techniques for Finding Derivatives, Derivatives of Products and Quotients, The Chain Rule, Derivatives of Exponential Functions, Derivatives of Logarithmic Functions

Chapter 5. Graphs and the Derivative: Increasing and Decreasing Functions, Relative Extrema, Higher Derivatives, Concavity, and the Second Derivative Test, Curve Sketching

Chapter 6. Applications of the Derivative: Absolute Extrema, Applications of Extrema, Business Applications: Economic Lot Size, Economic Order Quantity, Elasticity of Demand, Implicit Differentiation, Related Rates

Chapter 7. Integration: Anti-derivatives, Substitution, Area and the Definite Integral, The Fundamental Theorem of Calculus, Area Between Two Curves, Numerical Integration

Chapter 8. Further Techniques and Applications of Integration: Integration by Parts, Volume, Average Value, Continuous Money Flow, Improper Integrals

Supplementary Chapter: Systems of Linear Equations and Matrices:

Solution of Linear Systems, The Echelon Method, The Gauss-Jordan Method, Addition and Subtraction of Matrices, Multiplication of Matrices, Matrix Inverses, Input-Output Models

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### Grading:

For each course, the instructor chooses a grading strategy appropriate to departmental and college guidelines, and the related discipline. Some of the recommended options include (but not limited to) the following:

With **criterion-reference grading**, students receive grades based on the quality of their work in relation to the criteria defined by the instructor and by the rubrics or models specifying the qualities of each grade. Some instructors may choose to adjust the scale (criteria) if a need arises.

**Norm-based grading** is used in the course which is based on how others in the class perform. This method is generally used in large lecture courses or coordinated multi-section courses. The distribution of grades may be based on CLAS recommendations.

**Grading System:** Plus/minus grading will be used.

XX% X midterms (dates)

XX% Final exam (date, time and place to be announced)

XX% X Quizzes, about every other week (dates)

XX% Homework, assigned weekly, and usually due the following week

XX% Attendance and class participation (optional)

**All exams are comprehensive**, unless specified otherwise.

**A Word about the Date and Time of the Final Exam:** The date and time of every final examination is announced by the Registrar generally by the fifth week of the classes. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

**Make-up policy:**

As stated in CLAS webpage: <https://clas.uiowa.edu/faculty/student-attendance-and-absences>:

“University policy requires that students be permitted to make up examinations missed because of illness, mandatory religious obligations, authorized UI activities, or unavoidable circumstances. An unavoidable circumstance is defined as an event beyond the student's control and often involves a serious and unexpected hospitalization, a family tragedy, or a related incident. Such circumstances **do not include** attendance at a wedding, a family vacation, obligations related to work or other such matters. The instructor of a student participating in an authorized UI activity is sent a statement generally by email from the UI official in charge of the event before the absence occurs; this statement will include the specific date and time that the student will miss class. Activities related to employment, fraternities or sororities, or volunteer activities are not UI authorized activities.”

**Student Collaboration:** Student collaboration is NOT permitted on exams. Any attempt to collaborate during exams will result in a 0 score on that test. **The instructors will specify if collaboration is allowed on assignments and, if so, the expectations for a student's individual performance.**

**Other Course Policies: For Fall 20xx**

Students are expected to attend all lectures, and do all of the homework regularly. Students are responsible for everything covered in the lectures, textbook and the prerequisites. Important announcements about changes (if necessary) to the syllabus, homework, exams, etc. will be done in the lectures or they will be e-mailed to your UI e-mail address.

There may be quizzes, depending on the section (excluding the weeks of the exams), consisting of problems similar to those assigned as homework. Taking all quizzes and all exams (midterms and final) is mandatory. In the exams, you are expected to show all of your work in an organized and coherent fashion. In the long problems, all work must be shown, and giving only a final solution obtained by guessing or using a calculator may not earn full credit. Make-ups may be given for the exams missed due to unavoidable circumstances and compelling reasons which are documented in writing. If you have a conflict or a medical reason, discuss your situation with your lecturer as soon as possible.

You are strongly encouraged to go to your lecturer's office hours as well as your TAs. Make an appointment, if you have a conflict with the listed office hours.

Cell phones must be turned off during the lectures and exams. If you have to read or text a message during the lecture, please do it outside the classroom. During the exams, the cell phones are required to be put (far) away, preferably at the bottom of your backpack. During the exams, you cannot hold them in your hand, not keep them on your desk, chair, or anywhere easily accessible, and you cannot use it as a calculator.

**Resources for Students:**

Math Tutorial Lab: 125 MLH <http://www.math.uiowa.edu/math-tutorial-lab>

Students will find the Writing Center and the Speaking Center very useful for this course:

Writing Center: <http://www.uiowa.edu/~writingc/>

Speaking Center: <http://clas.uiowa.edu/rhetoric/for-students/speaking-center>

### **Notes to the Students:**

1. All students in the College have specific rights and responsibilities. You have the right to adjudication of any complaints you have about classroom activities or instructor actions. Information on these procedures and your responsibilities is available in the Schedule of Courses and on-line in the College's Student Academic Handbook, (<https://clas.uiowa.edu/students/handbook> ) In summary, first see the person you wish to complain about, and then see his/her immediate supervisor. The chain is: graduate or undergraduate assistants, then Prof. XX, then the Chairman of the Department of Mathematics Prof. YY, and then an appropriate Dean. The Department of Mathematics has offices in 14 MLH (MacLean Hall). To make an appointment to talk to the chairman of the department call 335-0714 or contact the departmental secretary in 14 MLH.
2. We would like to hear from anyone who has a disability which may require some modification of seating, testing, or other class requirements so that appropriate arrangements may be made. Please contact your lecturer during his office hours, in the beginning of the semester and far in advance of the exams. You should notify the Office of Student Disability Services, SDS and obtain the form(s) needed. The necessary modifications will be made available to you after the SDS processes and approves your request.
3. We are planning to use ICON for posting grades and other course material. Also, some announcements may be e-mailed through ICON to your UI e-mail. Check ICON and your UI e-mail regularly, and make sure that UI has your correct e-mail address.
4. This course plan may be modified during the semester. All changes will be announced in class in advance. It is solely the student's responsibility to be informed of such announced changes.

### **CLAS Teaching Policies & Resources — Syllabus Insert**

<https://clas.uiowa.edu/faculty/teaching-policies-resources-syllabus-insert>