

## **BUS 250: Applied Mathematics in Business**

*Fall 2021*

This syllabus is subject to change as the semester progresses.

Instructor: Ming Shou

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Please begin the Subject Line with BUS250

Class Meetings: Section 1: Wednesday and Friday from 9: 00 am-10:15 am via Zoom  
Section 2: Wednesday and Friday from 10:30 am-11:45 am via Zoom

Office Hours: WF 12:00-1:00 pm via Zoom or by appointment. Please email at least one day ahead of time to make an appointment so I can schedule a Zoom meeting with you.

Zoom Meeting ID: 975 0330 7636

Passcode: BUS250

### **1. Prerequisites**

Two years of high school algebra.

### **2. Course Objectives:**

- Understand how to categorize a firm's costs as variable and fixed, form its cost and revenue lines, model the firm's break-even point and target profit.
- Develop expertise using the formalism of time value of money (TVM) to find the solution to problems involving present value, future value, number of time periods, periodic payments, interest rate, perpetuity, and annuity.
- Understand and apply the formalism of elementary combinatorial techniques, permutations and combinations, and binomial expansion formalism and develop and use key concepts in discrete and continuous probability.
- Understand hypothesis testing, the sampling distribution, "the p-value," and their role in statistics.

### **3. Course Materials**

- Recommended book: Bowerman, Business Statistics in Practice 9e, 2018, New York: McGraw-Hill Education.
- Recommended book: Berk, DeMarzo, and Harford, Fundamentals of Corporate Finance, Pearson/Prentice-Hall, 5th edition.
- Class slides and other materials will be available on Lualima.

#### 4. Course Requirements

**Grading:** Your course grade will be based on a reasonable curve over the weighted sum of grades accumulated on participation, homework, and exams. The weighting scheme is:

<b>Description</b>	<b>Percent</b>
Participation	10
Homework	30
Midterm	30
Final Exam	30
<b>Total</b>	<b>100</b>

The guidelines for letter grades are as follows. Plus or minus grades will be used to distinguish performance within letter grades.

A = demonstrates outstanding mastery of topics and outstanding ability to apply and extend concepts;

B = demonstrates above-average mastery of topics and ability to apply them;

C = demonstrates mastery of topics and ability to apply them;

D = inadequate demonstration of topic mastery and application;

F = grossly inadequate demonstration of topic mastery and applications.

**Participation:** Enrollment in a course presupposes the intention to attend regularly. Students who are absent for any reason are responsible for work missed. Attendance will be taken on Zoom. Absence for any personal reasons should be brought to the instructor's attention via email before the class.

**Homework:** Homework will be assigned through Lulima-Assignments. The homework may be completed in groups of up to 4 students. If working in a group, please follow University social distancing guidelines. The homework is to be uploaded on Lulima-Assignments. Only one student per group needs to submit the homework. If your name appears on more than one homework submission, you will be given the lowest score of the submissions. Once the deadline for homework has passed, you will not be able to complete it for credit. Do not leave the homework until the last minute, as there will be no extensions without valid reasons.

**Examinations:** There will be a midterm (tentative schedule: October 20) and a final exam at the end of the semester. The exams will be assigned and should be returned on Lulima.

Make-up exams may be given only under very rare circumstances, and the instructor reserves the right to deduct points as deemed appropriate. If an exam must be missed, the student must request approval from the instructor **prior** to the absence. **No make-up exam will be given without prior approval** and will be considered only in legitimate, unavoidable circumstances. **Proper documentation for the absence must be presented.** If allowed, make-up exams will be scheduled at the discretion of the instructor. Make-up exams may be more rigorous and graded to a higher standard than the original. If students believe that there is an error in the grading of an exam, they should call it to the instructor's attention within a week after the results are posted on Lulima. If a student believes a question has been graded unfairly, the policy is to re-grade the entire homework/exam.

**Problem-solving classes:** Problem-solving sessions will involve students solving questions assigned on Lulima. Solutions will be provided after each session. Though these questions are not graded or mandatory, it is highly recommended to complete them.

## 5. Administration

**Students with Disabilities:** Students with disabilities are encouraged to contact me and the KOKUA Program for accommodations. For more information about the KOKUA Program, visit <http://www.hawaii.edu/kokua/>. Any student with special needs should bring this to the attention of the instructor as soon as possible, but not later than the end of the second week of class.

**Academic Honesty:** Students are expected to be responsible in relations with other members of the UH Manoa community, respect the interests of the institution, and follow the Student Code of Conduct, which is available at [http://www.studentaffairs.manoa.hawaii.edu/policies/conduct\\_code/](http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code/). Violations of this code include matters of alleged academic dishonesty, such as cheating and plagiarism. According to the Code of Conduct:

The term “cheating” includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations; (2) use of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the UH faculty, staff or student; (4) engaging in any behavior specifically prohibited by a faculty member in the course syllabus or class discussion.

The term “plagiarism” includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

All incidents will be handled in accordance with the UH Student Code of Conduct.

## 6. Tentative Course Schedule

The schedule is subject to change as the semester progresses. We have a lot of topics to cover, each deserving of their own course. Due to the limited amount of time, we have some of the topics that will be covered at a broad level.

### **Part 1: Introduction and reviews (two weeks)**

Algebra review, cost-volume-profit analysis, and break-even points

Calculus review and profit maximization

Excel skills review

### **Part 2: Mathematics of Finance-time value of money (three weeks)**

Time value of money, discounting, and compounding

Number of time periods, interest rates, present value, periodic payments, and future value

Perpetuity and annuity

**Part 3: Probability (two weeks)**

Probability, events, union, and intersection

Conditional probability

Combinations and permutation

**Part4: Discrete and continuous random variables/distributions (four weeks)**

Two types of random variables

Discrete and continuous distributions

Normal distribution and standard normal distribution

Samples, sample statistics, and central limit theorem

**Part 5: Hypothesis testing (three weeks)**

Type I and type II errors

Critical values and p-values

Hypothesis testing