Instructor:	Aidin Hajikhameneh
Office Location:	DMH 142
Email:	aidin.hajikhameneh@sjsu.edu
Online Office Hours:	Tuesday, 12:00pm-1:00pm (through Canvas); and by appointment
Class Days/Time:	Mo 10:30AM - 1:15PM
Classroom:	DMH 165
Prerequisites:	ECON 1A, ECON 1B, & MATH 30 or MATH 71

1 Course Description

1.1 Catalog Description

Applications of linear algebra and differential calculus to economic analysis. Topics include market equilibrium, properties of production functions, multipliers, optimization methods, comparative statics analysis. Prerequisite: ECON 1A, ECON 1B, & MATH 30 or MATH 71

1.2 Additional Description

Mathematics and mathematic modeling are essential components of an economist's toolkit. The main objective of this course, hence, is to provide students with the basic mathematical knowledge required to analyze economic problems. To this end, during the semester, we will mainly focus on the following topics: single and several variable calculus, calculation of derivatives (including partial derivatives), optimization (constrained & unconstrained), matrix algebra, and linear programming.

SJSU classes are designed such that in order to be successful, it is expected that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related

activities including weekly assignments, in-class simulations, and three exams. Careful time management will help you keep up with readings and assignments and enable you to succeed in this class. More details about student workload can be found in University Policy S12-3.

2 Course Learning Outcomes and Program Learning Objectives

This course fits into the following Department of Economics program leaning objectives (PLO).

- PLO 4: Specialist Area (Policy Economics, Quantitative Methods)

Upon successful completion of this course, students should be able to demonstrate the following:

- CLO 1: define and explain indifference curve, isoquant, cost minimization, profit maximization, equilibrium conditions in output and input markets, and the national income model.

- CLO 2: identify and apply functions of one or more variables, simple differentiation, partial and total differentiation, and matrix algebra.

- CLO 3: solve simple real-world optimization problems both mathematically and graphically.

3 Required Texts/Readings

3.1 Primary Textbook (Required)

- Essential Mathematics for Economic Analysis, 5th Edition, by Knut Sydsaeter, Peter Hammond and Arne Strom.

If you choose to use an older version of the text, it is your responsibility to account for any differences in assigned readings and homework problems.

3.2 Other Readings (Not Required)

- "Intermediate Microeconomics: A Modern Approach" by Hal Varian is the textbook if you want a refresher on microeconomics.

- "Mathematics for Economists", by Lawrence Blume & Carl P. Simon for an advance treatment of topics covered in this course.

4   Office Hours via Zoom on Canvas

I have synchronous office hours via Zoom in Canvas on Tuesdays from 12:00 to 1:00 pm. This is an excellent opportunity to interact with your fellow students and me in real time. To join office hours from PC, Mac, Linux, iOS or Android, use the following links and password:

https://sjsu.zoom.us/j/89062267866?pwd=WGw3a2hvRk1KdnN1dEs0dEhxOXRVQT09

Password: 980826

5   Assignments and Grading Policy

Grades for this course are composed of three homeworks, two midterms, and a final exam. The grading rubric and a description of each component is provided below:

Grade Breakdown:

- Homeworks   30% (10% each)

- Midterm Exams   40%

- Final Exam   30%

5.1   Homework

There will be 3 homework assignments. Each is worth 10% of the final grade. Take the homework assignments seriously. Students often learn more from carefully thinking through the homework questions than taking exams. Working in groups on homework assignments is allowed (and advised). Each student must hand in a separate write-up. Students should submit their homework assignments through Canvas in a Microsoft Word or PDF file. The file name should be of the following format:

First name-Last name-Student number-Course name-Homework #

For example:

Aidin-Hajikhameneh-123456789-Microeconomic Analysis-Homework 1

5.2   Midterm and Final Exam

Each midterm is worth 20% of your grade. The final exam is worth 30% of your grade. The two midterms mainly cover calculus related subjects such as functions, derivatives, and optimizations. The final exam

only covers matrix algebra and linear programming. Exams will be mainly composed of problem-solving questions. The best way to prepare is to review all homework assignments, study all of the readings, and practice with some of the questions out of the primary textbook.

5.3 Grading Criterion

Your grade is determined at the end of the semester based on your performance on homework assignments (30%) and three exams (70%). Grades will be curved in the end of semester as needed. Letter grades will be determined as shown in Table 1:

Category	Letter Grade	Numerical Grade
	A^+	97-100
A	A	93-96
	A^-	90-92
	B^+	87-89
B	B	83-86
	B^-	80-82
	C^+	77-79
C	C	73-76
	C^-	70-72
	D^+	67-69
D	D	63-66
	D^-	60-62
F	F	Below 60

Table 1: **Grading Criteria.**

6 University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page.

7 MYSJSU Messaging

Copies of the syllabus, assignments, notes etc. can be found on Canvas Leaning Management System. Check the Canvas for updates regularly.

8 Econ 104 Course Schedule and Readings

All due dates and due times are according to Pacific Standard Time (PST).

Week	Date	Topics & Readings	Due
1	1/31	Overview of the course & Properties of Functions (Ch. 4 and 5)	
2	2/7	Properties of Functions (Ch. 4 and 5) (cont.)	
3	2/14	Differentiation (Ch. 6)	
4	2/21	Differentiation cont. (Ch. 6)	
5	2/28	Derivatives in Use (Ch. 7)	
6	3/7	Single Variable Optimization & (Ch. 8) Functions of Many Variables (Ch. 11)	
7	**3/14***	Functions of Many Variables (cont.) & (Ch. 11) Multivariable Optimization and (Ch. 13)	***HW1** **Due March 14 by 10:30 am**
8	**3/21****	**Midterm I****	**From 10:30am to 11:45am**
9	4/4	Constrained Optimization (Ch. 14)	
10	4/11	Matrix and Vector Algebra (Ch. 15)	
11	**4/18***	Determinants and Inverse Matrices (Ch. 16)	***HW2** **Due April 18 by 10:30 am**
12	**4/25****	**Midterm II****	**10:30am to 11:45am**
13	5/2	Determinants and Inverse Matrices (Ch. 16) (cont.)	
14	5/9	Linear Programming (Ch. 17)	
15	**5/16***	Review	***HW3** **Due May 16 by 10:30 am**
Final Exam	5/19	9:45am-12:00pm.	

Table 2: **Spring 2022 Course Schedule.**