CALIFORNIA STATE UNIVERSITY, SACRAMENTO
DEPARTMENT OF ECONOMICS

ECON 200M: Mathematics for Economists
FALL 2009

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Course URL: www.csus.edu/indiv/v/vangaasbeckk/200M	Office Hours: Tues 9:30-11a.m., Wed 3:30-5p.m., or by appointment

General Information

Lecture:	W 5:30-8:20pm	Prerequisites:	ECON 100A, 100B, &
Section:	01		MATH 26A

Catalog Description

Equips students with the mathematical techniques necessary for the study of economics and econometrics at the graduate level. Covers linear algebra, derivatives, comparative static analysis, optimization, integrals, and differential equations, with specific applications from economic and econometric theory.

Scope and Objectives

This course is designed to develop and apply the mathematical tools used in economic models and econometric methods at the graduate level.

At the end of this course, you should be able to:
  (i) use a variety of functional forms to express economic relationships,
  (ii) apply differentiation to understand marginal tradeoffs,
  (iii) solve problems of constrained and unconstrained optimization to identify economic choices and outcomes,
  (iv) use matrix algebra and first-order difference equations to express and solve systems of equations used in economic models, and
  (v) apply integration techniques to measure value.

By the end of the semester, you will have the mathematical tools employed in the core and elective graduate courses. You will apply these tools to understand and analyze theory and statistical methods used in economic research.

Textbook

Required: Hoy, M., Livernois, J. McKenna, C. Rees, R. & Stengos, T. (2001). *Mathematics for Economics,* (2nd ed.) MIT Press. ISBN: 978-0262082945.
Optional: 1. Mendelson, E. (2007). *Schaum's Outline of Beginning Calculus* (3rd ed.) McGraw-Hill. ISBN: 978-0071487542 (for review of first-semester calculus)
2. Textbooks from intermediate macro and intermediate micro theory

Grading

Your grade will be determined according to the following weighting:

Homework	40%
Midterm Exam	25%
Final Exam	35%

Grades will be distributed according to the following scale (approximately):

A	90 or above	C	68-78	F	Less than 57
B	79-89	D	57-67		

Assignments and Exams	▪ Give yourself ample time to complete the assignments. I encourage you to work together on assignments, but all work completed for a grade must be your own. If you have difficulty completing assignments, please begin them early and seek out my help during office hours (or make an appointment to see me).

▪ The prerequisites for this course are strictly enforced.

    o While we will review the concepts from first-semester calculus, you should feel comfortable with calculus *before* taking this course. If it has been some time since you've completed calculus, then you should expect that you will need to spend more time on review before attempting the homework and exams.

    o This course makes use of concepts from intermediate macroeconomics and microeconomics you are expected to be familiar with. We will build upon these models using mathematical tools without detailed review of the economic concepts studied in intermediate theory.

▪ Assignments and exams will be challenging and likely require several hours to complete. While every student comes to the course with different preparation, a good rule of thumb for a graduate course is that you should spend about three hours studying for each one hour of class time. You should, on average, expect to spend <u>at least 8-9 hours per week</u> outside of the classroom on this course.

▪ Late assignments will receive a letter grade reduction in the maximum possible score for each business day they are late.

Policies

1. Academic honesty is expected. You will receive a mark of zero on any work where cheating or plagiarism occur. Students suspected of cheating will be reported to Judicial Affairs. Please review the *University Policy Manual*.

2. Exams will be closed book and given in class.

3. There will be **no makeup examinations**. Exam dates are given in the course outline below and are on posted online. This is to avoid any potential conflicts.

4. Attendance is expected. If you miss a class, be sure to check with your fellow classmates to see what you missed.

5. Come to class on time; you will not be given extra time if you are late for an exam.

6. If you decide to withdraw from this class, make sure you do so with the registrar. If you withdraw without permission, you will be assigned a failing grade. Students will not be assigned a grade of "WU".

7. In order to be assigned a grade of "I", the student must: complete satisfactory progress both up through the drop deadline in the course and up to the point when the student requests an incomplete grade be assigned, and the student's request must meet the conditions provided in the *University Policy Manual*.

8. Keep cell phones and laptop computers shut off during class. During exams, you <u>may not</u> use your cell phone as a calculator. You <u>must</u> bring a calculator without programming capabilities. Financial and graphing calculators are not permitted.

9. If you have a learning disability or a physical disability that requires accommodation, please let me know as soon as possible. All needs that have been verified through the Services to Students with Disabilities (Lassen Hall) will be accommodated. Requests for special testing accommodations must be given to the instructor at least one week prior to the exam date.

Course Outline

	Dates	**Topic**	**Textbook**	**Review Material** (Schaum's Outline)
Week 1	Sept. 2nd	Introduction to the Course Review of Mathematical Fundamentals	Chapter 1 Chapter 2	Chapters 1-7
Week 2	Sept. 9th	Sequences, Series, Limits and Continuous Functions	Chapters 3-4	Chapters 8-10, 34-35
Week 3	Sept. 16th	Review of Univariate Calculus and Optimization	Chapters 5-6	Chapters 11-17
Week 4	Sept. 22nd	Economic Applications of Optimization	Chapter 6 (continued)	Chapters 18-24
Week 5	Sept. 30th	Introduction to Linear Algebra	Chapters 7-9	
Week 6	Oct. 7th	Working with Matrices: Determinants Exam Review	Chapter 9 (continued)	
Week 7	Oct. 14th	**Midterm Exam**	Chapters 1-9	
Week 8	Oct. 21st	Introduction to Multivariate Calculus	Chapter 11	
Week 9	Oct. 28th	Unconstrained Optimization	Chapter 12	
Week 10	Nov. 4th	Constrained Optimization	Chapter 13	
Week 11	Nov. 11th	**No Class** (Veterans' Day Holiday)		
Week 12	Nov. 18th	Comparative Statics	Chapter 14	
Week 13	Nov. 25th	**No Class Meeting** (Faculty Furlough Day) Integration	Chapter 16	
Week 14	Dec. 2nd	Review of Integration First-Order Difference Equations	Chapters 18-19	
Week 15	Dec. 9th	First-Order Difference Equations (continued) Exam Review		Chapters 30-31
	Dec. 16th	**Final Exam** (5:15-7:15pm)		

Faculty are required to take a total of 9 furlough days during the semester during the 2009-2010 academic year. One of these days is a campus-wide furlough day, designated by the President (October 16, 2009). The remaining 8 days are selected by the individual faculty and subject to approval by the dean. On furlough days, the instructor is not permitted to hold office hours, respond to e-mail, etc. A complete list of my furlough days (including days when our class does not meet) will be posted on the course web site. The University has recommended that faculty make up for this missed in-class meeting time through additional assignments. In my class, I will assign textbook reading with

some supplements in lieu of an in-class lecture on Wednesday, November 25th. We will then review this material during the following class meeting.