

MAT 270 – Calculus I
Spring 2000

MAT 270 B
8:40–9:30 MWTHF ED-250
8:40–9:30 TH ECA-225

Instructor: Dr. Rafael Pacheco

Office: PSA 823

Office hours: T 8:40–10:30am; Th 1:40–2:30pm or by appointment

Web Page: <http://math.la.asu.edu/~rpacheco>

Phone: 965-3750

Text: Stewart, J., *Calculus–Early Transcendentals*

Prerequisite: MAT 210, or equivalent.

Calculator: A graphing calculator is recommended for this course. If you already own one, you may use it. If you do not own one, a TI-86 or comparable model is recommended.

TEST: (50%) There will be 4 in-class exams, each worth 100 points. In addition, there are 50 points attached to the **Mastery Test** (see next item) for a total of 450 points.

Mastery Test: This consists of problems testing the basic techniques of differentiation. Be aware that you will have *3 opportunities to reach the required grade of 85% or better*. If successful, you will receive *all 50 points* for this exam; otherwise you will receive *0 points* for this exam. This exam will be taken in the Testing Center, PSA 21, on 3 successive Mondays and Tuesdays beginning March 20.

Quizzes and Homework: (25%) No make-up Quizzes will be given and late homework will not be accepted.

Final Exam: (25%) All sections of MAT270 will have a common final exam on Saturday, May 6 from 7:40am–9:30am. The final exam schedule listed in the schedule of classes will be strictly followed. It is the policy of the Department of Mathematics that makeup exams will only be given for the following reasons:

1. Religious conflict (e.g., the student celebrates the Sabbath on Saturday).
2. The student has more than three exams scheduled on the day that includes the mathematics final.
3. There is a time conflict between a student's mathematics final and another final exam.
4. There is a last-minute personal or medical emergency.

GRADING AND POLICIES: Make-up exams are at the discretion of the instructor. In any case, no make-up exam will be given unless the student has notified the instructor **before** the test is given and provides written documentation. (The Department of Mathematics has stringent policies regarding the Final Exam. Please speak to me if you have any questions). Messages may be left with the Mathematics Department office. Grades will be based on the number of points earned. "Floors" for letter grades: A–90%, B–80%, C–70%, D–60%.

SUGGESTION FOR STUDY: I encourage you to collaborate with other MAT 270 students, for example by forming a *study group* of members from class. ***Working on assigned problems and class attendance are essential to survival.***

I welcome your questions and your discussions outside of class, and hope that our work together will result in your developing both understanding and enthusiasm when it comes to calculus.

IMPORTANT DATES: Monday, February 7, Drop-add. Friday, February 11, Unrestricted course withdrawal. Friday, March 31, Restricted complete withdrawal.

NOTES: Deviations from the above and changes to the schedule below are at the discretion of the instructor.

Topics:

Chapter 1: Functions and Models

- 1.1: Four Ways to Represent a Function
- 1.2: Mathematical Models
- 1.3: New Functions from Old Functions (CL)
- 1.4: Graphing Calculators and Computers (CL)
- 1.5: Exponential Functions
- 1.6: Inverse Functions and Logarithms

Chapter 2: Limits and Derivatives

- 2.1: The Tangent and Velocity Problems
- 2.2: The Limit of a Function
- 2.3: Calculating Limits Using the Limits Law
- 2.4: The Precise Definition of a Limit (This can be done later if time permits)
- 2.5: Continuity - (May have to be reduced to an intuitive treatment)
- 2.6: Limits at Infinity; Horizontal Asymptotes
- 2.7: Tangents, Velocities, and Other Rates of Change
- 2.8: Derivatives
- 2.9: The Derivative as a Function

Chapter 3 Differentiation Rules

- 3.1: Derivatives of Polynomials and Exponential Functions
- 3.2: The Product and Quotient Formulas
- 3.4: Derivatives of Trigonometric Functions
- 3.5: The Chain Rule
- 3.6: Implicit Differentiation
- 3.7: Higher Derivatives
- 3.8: Derivatives of Logarithmic Functions
- 3.9: Hyperbolic Functions (Inverse hyperbolic functions not required.)
- 3.10: Related Rates
- 3.11: Linear Approximations and Differentials

Chapter 4 Applications of Differentiation

- 4.1: Maximum and Minimum Values
- 4.2: The Mean Value Theorem
- 4.3: How Derivatives Affect the Shape of a Graph
- 4.4: Indeterminate Forms and LHospitals Rule
- 4.5: Summary of Curve Sketching (CL)
- 4.6: Graphing with Calculus and Calculators (CL)
- 4.7: Optimization Problems
- 4.9: Newtons Method (CL)
- 4.10: Antiderivatives

Chapter 5 Integrals

- 5.1: Areas and Distances
- 5.2: The Definite Integral

- 5.3: The Fundamental Theorem of Calculus
- 5.4: Indefinite Integrals and the Total Change Theorem
- 5.5: The Substitution Rule

References

- [1] Stewart, J., *Calculus—Early Transcendentals*, Brooks/Cole Publishing Co., Pacific Grove, CA, 1999.
- [2] Pacheco, R., MAT 270—Lecture Notes. *Department of Mathematics*, Arizona State University (2000).

Table 1: Weekly Schedule

week	Month	Material: Computer labs will be devoted to portions of each week's material
1	1/17	Martin Luther King Holiday. Introduction to course and MAPLE. Sections 1.1–1.4
2	1/24	Sections 1.5–1.6 and beginning of Chapter 2
3	1/31	Sections 2.2–2.4. Review
4	2/7	Test #1 (Ch. 1, 2.1–2.3 Monday 2/7). Sections 2.4–2.6
5	2/14	Sections 7–9 of Chapter 2 and Section 3.1
6	2/21	Sections 2–5 of Chapter 2
7	2/28	Sections 6–8 of Chapter 2
8	3/6	Sections 3.9–3.10. Review on Wednesday 3/1. Test #2 (2.4–2.9, Ch. 3 Thursday 3/9)
9	3/13	Spring break
10	3/20	Mastery test 1. Sections 3.10–3.11 and 4.1–4.3
11	3/27	Mastery test 2. Sections 4.4–4.7
12	4/3	Mastery test 3. Sections 4.9–4.10. Review
13	4/10	Test # 3 (3.10, 3.11 and Ch. 4 4/10). Distance and area. Chapter 5
14	4/17	Integrals, Sections 5.3–5.5
15	4/24	Section 5.5, review and Test #4 (Ch. 4, 5 Friday 4/28)
16	5/1	REVIEW. Classes end 12/1 (W). Final Exam is Saturday, May 6 at 7:40–9:30

Table 2: Assigned problems

Section	Problems	Section	Problems
1.1	2,9,10,11,16,20,24,35,54,55	3.6	2-20(even),33,34,41-50
1.2	5,8,9,10,12,17,20	3.7	4,5-12,33,34,44,49,53,54,56
1.3	4,5,6,25,36,54,58,62	3.8	2-24(even),31,41,42
1.4	2,26,27,28,32,34	3.9	8,12,20,30,41,42
1.5	4,17,18,20,22,23,24,26	3.10	4,5,7,8,12,14,18,20,21,22,24,27
1.6	14,18,20,24,28,30,35-40,46,54	3.11	4,6,8,11,12,28,31,41
2.1	2,5,6,8	4.1	6,11,12,14,32,36,48,50,54,66,72,76
2.2	2,5,8,10,16,18,36,40	4.2	2,9,12,24
2.3	2,4,5,12,16,18,38,43,46	4.3	2,8,10,12,15,21,26,30,56
2.4	4,6,8,14	4.4	5,6,10,14,21,28,38,40,56,62,70
2.5	4,6,8,10,12,16,20,36,40,43	4.7	4,5,6,10,12,16,21,22,24,28,30,33,34,38,48,52
2.6	4,6,8,15,16,22,24,34,36,38,42	4.9	11,12,14,19
2.7	6,7,8,13,16,21,22,24	4.10	2-42(even),46,47,60,64,72,74,75
2.8	2,3,4,6,11,20,22,28	5.1	2,4,6,9,11,14
2.9	2,3,4,6,10,12,19,20,26,32,35	5.2	6,8,10,14,29,31,34
3.1	4-28(even),38,40,44,45,47	5.3	6,8,18-38(even),62,64
3.2	4-22(even),32,35,36,40		
3.4	1-16,21-24,33,34		
3.5	8-42(even),48,55,56,66,72		