

# University of Notre Dame

**Math. 166, Calculus for Honor Math., Spring of 1997.**

**Instructor:** Dr. Hong-Ming Yin.

**Text Book:**

Calculus, vol. 1 (second edition) by Tomm. Apostol.

**Final Grade**

Final Grade will be based on the following percentage:

Homework: 15%. There will be about 10 homework assignments.

Quiz 1: 5%, on February 6, from 11:00-11:20 am at CCBC 326.

Test 1: 20%, on March 6, from 11:00-12:00 a.m., at CCMB 326

Test 2: 20%, on April 17, from 11:00-12:00 a.m., at CCMB 326

Final Exam.: 40%, May 8 from 1:45 to 3:45 pm, at DBRT 207.

**Sections Covered:** Chapter 7 (all sections), Chapter 9(section 9.1 to 9.8), Chapter 10 (all sections except for 10.21), Chapter 11 (Section 11.1-11.10).

**Daily Progress:**

L1: Review on Integration Techniques (Chapter 5) (Jan.15)

L2: Logarithm Functions ( Sect. 6.1-6.5), (Jan. 16)

L3: Differentiation and Integration involving logarithm (Sect. 6.6-6.8) (Jan. 20).

L4: The exponential Function (sect. 6.12-6.14) (Jan. 22).

L5: Differentiation and Integration involving exponential( Sect. 6.15-6.17) (Jan. 22)

\*\*\*\*\* Review (Jan. 24)\*\*\*\*\*

L6: Hyperbolic functions and some inverse trigonometric functions (Sect. 6.18-6.21) (Jan. 27).

L7: Diff. and Integration involving Inverse trigonometric functions (Sect.

- 6.21) (Jan. 29)
- L8: Integration by partial fractions (sect. 6.23, part I) (Jan. 31).
- L9: Integration by partial fractions (part II) (Feb. 3).
- L10: Integration of rational trigonometric functions (sect. 6.24) ( Feb.5).
- L11: Summary on Integration Techniques (Feb. 6).
- L12: The Taylor polynomials (sect.7.1-7.4, Feb. 10).
- L13: Taylor's formula with remainder (sect. 7.5-7.6) (Feb. 12).
- L14: Taylor's estimates of Taylor's remainder (sect. 7.6, 7.9) (Feb. 14).
- L15: The little o-notation (sect. 7.9) Feb. 17).
- L16: Applications to indeterminate form (sect.7.10) (Feb.19).
- L17: L'Hopital's Rule (sect. 7.12) (Feb. 21).
- L18: " $\varepsilon - M$ " definition of limit at infinity (sect.7.14) (Feb. 24).
- L19: Other types of indeterminate forms (sect. 7.15-7.16) (Feb. 26).
- L20: Summary on finding limits of indeterminate forms (Feb. 28).
- L21: Compound Interests, exponential growth and decays (March 3).
- L22: Review for test 1 (March 5).
- \*\*\*\*\*Solution to Test 1\*\*\*\*\* (March 7).
- L23: Complex numbers (sect. 9.1-9.5) (March 17).
- L24: Complex functions (sect. 9.7-9.9) (March 19).
- L25: limits of sequences (sect. 10.1-10.2) (March 21).
- L26: Monotone sequences (sect. 10.3) (March 24).
- L27: Infinite series (sect. 10.5-10.8) (March 26).
- L28: Some special series (sect. 10.7-10.8) (March 27).
- L29: Comparison Tests for convergence (sect.10.11-10.12)( April 2).
- L30: Integral test and examples (sect.10.13) (April 3),
- L31: The Root Test and the Ratio Test (sect. 10.15) (April 7).
- L32: Summary on various convergence tests (April 9).
- L33: Alternating series Test (sect. 10.17) ( April 11).
- L34: Conditional and Absolute convergence (sect. 10.18) (April 14).
- L35: Review for Test 2 (Chapters 9 and 10) (April 16).
- \*\*\*\*\* Solution to Test 2\*\*\*\*\* (April 18).
- L36: Improper Integrals (sect. 10.23) ( April 21)
- L37: Improper Integrals (Part II) (April 23).
- L38: Pointwise convergence and uniform Convergence (sect. 11.1-11.2) (April 25)
- L39: Convergence of function series and Power series (11.3-11.6) ( April 28)
- L40: Power series and Taylor's series (11.8-11.10) (April 30).

**Comments on the text book:**

- (1) The textbook is very good and could be used in future.
- (2) As many students may become graders, I added an additional section on compounded interest rate and exponential growth-decays.
- (3) Chapter 8 (Differential Equations) is skipped. The students may be advised to take *Differential Equations* in future.
- (4) It is a good idea to make a copy of each lecture note in the library.