

Text: Goldstein, Lay & Schneider; Calculus and its applications - tenth edition (& other material to be distributed.)

Prerequisites: Successful completion of MTH U151

MTH U152 is the second of the two semester Calculus and Differential Equations Sequence for Biology and Life Sciences chapters 6 through 10 of the \text" roughly as a (re)introduction to Integral Calculus, in order to get quickly into differential equations used by biologists, which form the goal of the course.

Instructor: A. Hajian - 537 LA, # 5645 - hajian@neu.edu . Office hrs. M,W,Th 8:40 - 9:10 am , 11:40-12:00 noon.

Grading: Final Exam (2 hrs) , 40%. Weekly tests (¼ 30 min.) + homework etc. ¼ 60% ; (no make-ups.)

January 21: Last date to drop a class without a 'W' grade - March 25: Last date to drop a class with a 'W' grade.

Final Exam Period: April 15, April 18-22. Go to: www.registrar.neu.edu/~nexsched.html. for exact date.

OUTLINE: The material for topics in italics will be handed out. * is optional

Integral Calculus:

- Antiderivatives and Areas Under Curves - Definite Integrals - Properties of Definite Integrals
- *Numerical Integration

Integration Techniques:

- Substitution - Parts - Partial Fractions - Definite Integrals
- *Advanced Numerical Techniques - Improper Integrals - Separation of Variables

Linear Algebra:

- Matrix, Matrices - Inverses of Matrices - Determinants - Eigenvalues -
- Matrices and Differential Equations

Systems of Differential Equations:

- Two and Three Compartment Problems

*Numerical Methods:

- Euler's Method - Numerical Solutions for Circular Reactions
- Numerical Solutions of Higher Order Equations

Miscellaneous:

- Michaelis-Menten Processes - Control Systems - Tracer Experiments
- Inflow and Outflow Through Cell Membranes

Functions of Several Variables:

- Partial Derivatives - Maxima and Minima of Functions of Several Variables
- Lagrange Multipliers and Constrained Optimization - Total Differentials and Their Applications
- Method of Least Squares - Double Integrals - Directional Derivatives - Gradients - Exact Differentials

Line Integrals:

- Parametric Equations of Curves - Line Integrals - Integrating Exact Forms

From the \text" - (Odd problems only, unless specified.) * is optional

6. The Definite integral

- 6.1: (315) 2,3-7,15-19,25,27,33-39,44,49
- *6.2: (325) 1,2,5,9,15
- 6.3: (336) 1,3,7-13,19,25-33,47
- *6.4: (346) 1-5,9,11,17,19,23,25
- 6.5: (351) 1-7,8,9
- Sup: (363) 45,67

8. The Trigonometric Functions

- 8.1: (434) 5-17
- 8.2: (440) 1-11,21,23,27,31,37
- 8.3: (449) 1-29,33-39,40,43
- *8.4: (455) 13-31
- Sup: (457) 56,57,58

9. Techniques of Integration

- 9.1: (462) 1-13,17,19,23,25,31,37,41,45,47
- 9.2: (467) 1,5,9,13,17,21,25-29,33-37
- 9.3: (475) 1-15
- *9.4: (481) 1,5-13,29
- 9.5: (489) 9-12(all)
- 9.6: (495) 1-17,21-25,31-35,39,41,45

10. Differential Equations

- 10.2: (515) 1-5,9,13,15,19,21,25,29,32,35,37,38
- 10.6: (541) 3,5,6,7,9-13(all),18,21-26(all)