Math U 151

Instructor: Malagón López José.
Office hours: M,W 10:30 - 12:00, or by appointment.
Office: 526-A NI

Text: Goldstein, Lay and Schneider. *Calculus and its Applications, 10th Edition.*

Free Tutoring is available in 540B Nightingale Hall (NI).
Hours Mon-Wed 10:00 AM - 8:00 PM, Thurs 10:00 AM - 4:00 PM
and Fri 10:00 AM - 12:45

PeerTutoring is available in Snell Library. Go to the Peer Tutoring Center on the 2nd floor or phone (617) 373-2150 to schedule a private tutor.

Brief description: Is the first semester of the two semester Calculus and Differential Equations Sequence for Biology Majors. The course will cover the first four chapters of the text book roughly, as a (re)introduction to Differential Calculus, in order to get quickly into Differential Equations commonly used by biologists.

Prerequisites: YOU MUST KNOW HIGH SCHOOL ALGEBRA. If you are weak in this area, you better take MTH U121.

Grading: There is a mandatory 2-hour departmental Final Exam . There will be Exams every two weeks, the lowest grade will be drop. Also, there will be a Midterm.
NO MAKEUPS. The distribution of the final grade is given as follows:

Final Exam	**40 %**
Midterm	**30 %**
Quizzes	**30 %**

Homeworks will not be collected.

Incomplete: Incompletes are given under very limited circumstances. The student must have completed a significant portion of the course material and must have a C or better on that material. The Instructor CANNOT give an incomplete simply because a student is failing. It is University policy that no grade, including an incomplete, may be changed after one year. Exceptions must be authorized by the Academic Standing Committee.

NOTE: If you have any concern about the course , the instructor or your grades that cannot be resolved by speaking with the instructor, then please see the course coordinator Prof. Sandy Blank, balnk@neu.edu.

NOTE: Cell phones, portable computers, etc, should be off while in class.

MTH U151

Mathematics for the Biological Sciences

1st Semester

Outline

Differential Calculus

Infinity and Infintesimals
The derivative
The Rules of Differentiation
Second Derivatives
Curve Plotting
The Function That is Its Own Derivative
Exponentials and Logarithms

Pharmacokinetics

How to use semilog graph paper
Zero-order and first-order processes
Processes tending toward equilibrium
*Bi-exponential processes
*"Peeling" Data
Biological Half-life

Differential Equations

First steps
Homogeneous Linear Equations with Constant Coefficients
First Order Linear Non-homogeneous Differential Equations with Constant Coefficients
Non-homogeneous Linear Equations with Constant Coefficients I (particular solutions)
Non-homogeneous Linear Equations with Constant Coefficients II (general solution)
*Deeper into non-homogeneous equations
*Systems of differential equations

***Compartmental Problems**

Non-zero initial concentration
Two compartment series dilution
Diffusion between compartments

***Tracer experiments**

Quantification of radioactivity
Inflow and outflow through cell membranes

Trigonometric Functions

Radian Measure
Sine and Cosine
Calculus of trig functions

More Differential Equations

Complex Numbers
Complex Roots of Characteristic Polynomials
Nonhomogeneous Diff. Eq with Trigonometric Right Hand Side