

COURSE LEARNING OUTCOMES

DEPARTMENT:

Mathematics

<p>COURSE #: 20900 COURSE TITLE: Elements of Calculus and Statistics CATEGORY: TERM OFFERED: Regular Academic Semester PRE-REQUISITES: C or better in MATH 20500 or departmental permission PRE/CO-REQUISITES: HOURS/CREDITS: 4hrs/4credits DATE EFFECTIVE: 8/26/18 COURSE COORDINATOR: Chun S. Park</p>	<p>CATALOG DESCRIPTION : Introduction to differential equations including numerical methods; qualitative analysis of solutions; phase plane analysis for systems; biological applications; analysis of univariate and bivariate data; regression and correlation; random variables; the normal, Poisson and binomial distributions; statistical inference. A spreadsheet program such as <i>Excel</i> is used throughout the course.</p> <p>Suggested Text: <i>Mathematical Methods for the Life Sciences</i>, by Grossman, CCNY publ.</p>
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COURSE LEARNING OUTCOMES

Please describe below all learning outcomes of the course, and indicate the letter(s) of the corresponding Departmental Learning Outcome(s) (see list at bottom) in the column at right.

After taking this course, the student should be able to:	Contributes to Departmental Learning Outcome(s):
1. Use separation of variables to solve a differential equation.	a
2. Use a phase diagram to understand the qualitative behavior of a single autonomous differential equation.	a, b, d
3. Understand a phase plot for an autonomous system and relate its properties to the time plot of the solutions.	a, b, d
4. Demonstrate an understanding of how a differential equation is solved numerically and analyze properties of the solution from the output.	a, b, d
5. Formulate and analyze appropriate biological problems in terms of differential equations.	c, d
6. Understand and construct a regression analysis for bivariate data.	a, b, c, d
7. Demonstrate an understanding of the concept of a random variable	a, b
8. Understand and apply the binomial, poisson, and normal distributions to appropriate models	a, b, c, d
9. Derive a confidence interval estimate for a population parameter.	a, c

COURSE ASSESSMENT TOOLS

Please describe below all assessment tools that are used in the course. You may also indicate the percentage that each assessment contributes to the final grade.

1. 4 or 5 computer assignments using *Excel* (10% to 15%)
2. 3 or 4 Mid-term exam(s) (50-minute exams) (50% to 45%)
3. Final exam (40%)

DEPARTMENTAL LEARNING OUTCOMES *(to be filled out by departmental mentor)*

The mathematics department, in its varied courses, aims to teach students to

- a. perform numeric and symbolic computations*
- b. construct and apply symbolic and graphical representations of functions*
- c. model real-life problems mathematically*
- d. use technology appropriately to analyze mathematical problems*
- e. state (e1) and apply (e2) mathematical definitions and theorems*
- f. prove fundamental theorems*
- g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.*