Department of Mathematics
Pomona College

Course Outline for Mathematics 32S
Calculus III with Applications to the Life Sciences
Spring 2015

Time   MWF 11:00 am - 11:50 am
Place: MDSL Room 125 (Mudd Science Library)
Instructor: Dr. Adolfo J. Rumbos
Office: Mudd Science Library 106.
Phone/e-mail: ext. 18713 / arumbos@pomona.edu
Courses Website: http://pages.pomona.edu/~ajr04747/
Office Hours: MWF 9:00 am - 9:50 am, TR 9:00 am – 10:00 am, or by appointment
Text: *Calculus: Multivarible by McCallum et al*.   Publisher: Wiley.
Prerequisites: Calculus II

Course Description.   This course presents the core topics of Multivariable Calculus (Math 32) and probability in the context of problems from the life sciences. Topics include: vector fields, limits and continuity, differentiability, linearization, probability distributions, multiple integrals, line integrals, and Green's Theorem. Applications include models of species interaction in ecosystems, the spread of disease and mutations.

Assigned Readings and Problems.   Readings and problem sets will be assigned at every lecture. Homework assignments will be collected on an alternate basis. Students are strongly encouraged to work on every assigned problem. **Late homework assignments will not be graded**.

Grading Policy.   Grades will be based on the homework, three 50-minute examinations, plus a comprehensive final examination. The overall score will be computed as follows:

homework	20%
three 50-minute exams	50%
final examination	30%

Final Examination.
       Time: Tuesday, May 12   9:00 am - 11:00 am.
       Place: MDSL Room 125 (Mudd Science Library)

Math 3S **Spring 2015**

Tentative Schedule of Lectures and Examinations

Date			**Topic**
W	Jan.	21	Introduction: An Example from Epidemiology
F	Jan.	23	A simple SIR Model
M	Jan.	26	Paths in the plane and in space
W	Jan.	28	Continuous paths
F	Jan.	30	Differentiable paths
M	Feb.	2	Tangent lines to paths
W	Feb.	4	Applications: Modeling the interactions of species in an ecosystem
F	Feb.	6	Predator-prey systems
M	Feb.	9	Phase plane analysis
W	Feb.	11	Phase plane analysis (Continued)
F	Feb.	13	Equilibrium points and stability
M	Feb.	16	Review
W	Feb.	18	**Exam 1**
F	Feb.	20	Vector fields
M	Feb.	23	Differentiable vector fields
W	Feb.	25	Derivative of a vector field
F	Feb.	27	Linearization
M	Mar.	2	Linearization (continued)
W	Mar.	4	The derivative map
F	Mar.	6	The derivative map (continued)
M	Mar.	9	Real valued functions of a several variables
W	Mar.	11	Differentiability and the gradient
F	Mar.	13	Problems
M	Mar.	16	*Spring Recess!*
W	Mar.	18	*Spring Recess!*
F	Mar.	20	*Spring Recess!*

Date			**Topic**
M	Mar.	23	The predator-prey system (revisited)
W	Mar.	25	Integral curves
F	Mar.	27	*Cesar Chavez Day*
M	Mar.	30	Review
W	Apr.	1	**Exam 2**
F	Apr.	3	Application: Probability distributions
M	Apr.	6	Integration in the plane and in space
W	Apr.	8	Double and triple integrals
F	Apr.	10	Double and triple integrals (continued)
M	Apr.	13	Integration on paths
W	Apr.	15	Integration on paths (continued)
F	Apr.	17	Application: Periodic solutions
M	Apr.	20	Applications: Modeling mutation rates
W	Apr.	22	Probability distributions
F	Apr.	24	The Binomial and Poisson distributions
M	Apr.	27	Review
W	Apr.	29	**Exam 3**
F	May	1	Review
M	May	4	Review
W	May	6	Review
Tu	May	12	**Final Examination at 9 am**