California State University, San Bernardino  
Department of Mathematics  
Math 241, Section 1, Spring 2012  
Problem Solving in Calculus

Course and Instructor Information

Instructor: Charles Stanton  
Office location: JB 368B  
Telephone: (909) 537-5376  
Email: cstanton@csusb.edu  
Office hours: Monday 3-3:50 p.m.  
Tuesday, and Thursday 9-9:50 a.m.  
Wednesday, 11 a.m.-12 noon  
And by appointment.

Class Days/Time: Tuesday and Thursday 4-5:50 p.m.  
Classroom: JB 390  
Web page: http://www.math.csusb.edu/faculty/stanton/  
Schedule No.: 43183 & 43184

Blackboard

Copies of the course syllabus and course text may be found on the campus Blackboard site after the first week of classes.

Course Description

An approach to solving calculus-based problems incorporating a computer algebra system. Projects will include interpolation, numerical methods, differential equations and graphical approaches. One hour lecture and three hours laboratory. Prerequisites: some programming experience and MATH 212. Recommended: MATH 213. (2 units)

Course Goals/Objectives and Student Learning Objectives/Outcomes

Upon successful completion of this course, students will be able to:

1. Use Maple to calculate integrals, limits, and derivatives.
2. Use Maple to solve equations, both symbolically and numerically.
3. Use Maple to plot curves and illustrate basic concepts of Calculus.
Required Text

Textbook
Math 241 Lab book handout.

Course Content

The goal of the course is to show how technology may be used to your advantage in math courses. The course prerequisites are differential and integral calculus of one variable. We shall solve problems in calculus with the aid of computer software. The software we shall use in this course is Maple. Maple is a computer algebra system which is capable of performing mathematical processes in a wide variety of areas such as precalculus, calculus, multivariable calculus, linear algebra, combinatorics, differential equations, number theory, numerical analysis, statistics etc. Maple is an interactive system and there is little programming to be done. It must be stressed that this is not a course on Maple but rather how technology may help in mathematics. There are a wide variety of devices and computer software available, each with their advantages and disadvantages (for example, graphing calculators, Mathematica, Matlab, R, Sage, Scipy, etc).

Assignments

In the laboratory you will be asked to solve problems arising in calculus or some other branch of mathematics. In the seminar we shall briefly describe the mathematics behind the problem and suggest the Maple commands that might prove useful in deriving a solution. You will be expected to write up a solution to the problem and to describe how Maple was used in the process. Your report should not just contain "one line answers" but should describe and record the complete process. Your goal is to integrate the problem, discussion of the solution and how Maple was used to aid a solution in the report. A stranger reading your report should be able to reproduce the experiment and solve the problem from your work.

Grading Policy

Your grade will be based 70% on your written lab reports and 30% on the final exam and project. The final exam is Thursday, June 14, 10-11:50 am.
Grades:
A  92-100%
A-  89-91%
B+  86-88%
B   78-85%
B-  74-77%
C+  71-73%
C   62-70%
C-  60-61%
D   55-59%
F   below 50%

University Policies

Students should be familiar with the “General Regulations and Procedures” in the CSUSB Bulletin of Courses for the university’s policies on course withdrawal, cheating, and plagiarism.

Classroom Protocol
1. You are responsible for all material covered and announcements given in the class and/or posted on the Blackboard.
2. Cell phones, laptops, iPods/mp3 players, and other devices capable of electronic communication must be turned off and not visible during lectures and exams (no texting please). Ipods and such may not be used as calculators on exams.

Important Dates
Last day to add open classes without permission: April 6  MyCoyote
Census (Last day to drop/add with permission): April 20  MyCoyote
Memorial Day (campus closed) May 28
Final Thursday June 14, 10-11:50 a.m.

Support for Students with Disabilities
If you are in need of an accommodation for a disability in order to participate in this class, please contact Services to Students with Disabilities at UH-183, (909)537-5238.