# 0304-342-01: Problem Solving with Computers, Spring 2012 (2011-3)

**Exam #1 – Excel**  
Individual Work, Closed Book & Files, 50 minutes

**Instructions:** *Read carefully!*

* *Complete all of the following problems in a single Excel workbook, one problem per sheet.*
* *Header rows (Name, PSWC-Section# & Problem #) and problem statements must be included on all worksheets. There is an electronic copy of this exam on myCourses which you can download to copy problem statements into your workbook.*
* *All graphs must be clear & informative with titles, labels, etc.*
* *You must complete the exam using the lab PCs – do not use your own laptop.*
* *You may use the built-in Help system in Excel, but no other files or webpages.*
* *Save your work often during the exam period!*
* *When you are done, upload your Excel workbook to the* ***Exam #1 (Excel)*** *Dropbox on myCourses. The filename must include your name, PSWC-Section#, and Exam#1. The Dropbox will remain open for 5 minutes beyond the end of the class period for you to save your file and complete the Dropbox submission. Failure to complete the submission by the Dropbox deadline will result in a significant score penalty.*
* *Read, sign, and date the honor pledge at the bottom of the reverse side of this exam sheet.*
* *Be sure to put your name on this exam paper, answer the indicated questions in the provided spaces, and turn it in to the instructor before you leave. You are NOT required to edit the electronic copy of this exam nor upload it to the Dropbox.*
* *VERIFY that your submission to the Dropbox was successful before you leave!*

**Problem #1:** *(7 pts)*

The study of damped oscillation is important to many fields of engineering. One possible solution for the displacement, *x*, of a mass connected to a spring and damper is given below.

*xo* is the initial displacement of the mass; ** and ** are parameters that depend on the mass and other dynamic characteristics of the system.

Use *xo* = 6 cm and ** = 0.5 rad/s to calculate and plot the displacement of the mass from *t* = 0 to *t* = 15 s for three different values of the damping coefficient, ** = 0.1, 0.2 & 0.5 s-1. Use appropriate cell reference techniques so that you can copy the formula from one cell and paste it to all other cells in your data table.

**Question:** What is the maximum negative value of the displacement, *x*, and for which value of ** does it occur?

**Answer:**

**Problem #2:** *(7 pts)*

Calculate and plot the piece-wise continuous function, *f(x)*, given below over the range 0 ≤ x ≤ 5. Use the IF function so that the formula in all cells of your data table are identical.

**Question:** What is the maximum value of *f(x)* in the given range?

**Answer:**

**Problem #3:** *(6 pts)*

Use the Excel Solver to find the solution for the following set of simultaneous equations with the given constraint.

**Question:** What values of *x* & *y* satisfy the simultaneous equations?

**Answer:**

**Honor Pledge:**

*Since the multiple sections of this course do not take the exam at a common time, please sign and date the honor pledge below. The university and the Kate Gleason College of Engineering take academic honesty very seriously.*

I will not discuss the contents of this exam with anyone until after all students have completed this exam. I will not share any written or electronic materials related to this exam with anyone.

**Sign & Date:**