CVEN 302
Computer Applications in Engineering and Construction
Problem Set #10 Numerical Solutions to Initial Value Problems

Date distributed : 11.13.2009
Date due : 11.20.2009 at 11:30 a.m.

Return your solution either in class or in my mail box (8th Floor, CE/TTI) by the date shown above. Please show all your work and follow the rules outlined in the course syllabus.

1 Reading

Read Chapter 20 in Chapra (2008). Write a Matlab user-defined function to execute one iteration of the 2nd-order Runge-Kutta method for solution to an initial value problem. Test your solution with the model for fecal coliform die-off in a river given by

\[
\frac{dc}{dt} = -kc
\]  

subject to the initial condition \( c(0) = 3500 \) counts/100 ml, where \( k = 0.15 \) day\(^{-1}\).

2 Book Problems

Work problems 20.1(a,b, and d), 20.7(a) and 20.8. Make all calculations by hand; you may use Matlab to create any graphical results required.

A References
