

■ **ME 501 Analytical Methods in Engineering Homework 2**
Given 15.10.2014 Due to : 26.10.2014

■ **1- Solve Linear DEs.**

a - $x \frac{dy}{dx} - y = x^2 \cos [x]$

b - $y' + 2xy = x^2$

■ **2- Determine if the DE is homogeneous and solve.**

a - $(y^2 + yx) dx - x^2 dy = 0$

b - $\frac{dy}{dx} = \frac{x + 3y}{3x + y}$

■ **3 - Solve Bernoulli's DE**

a - $x^2 \frac{dy}{dx} - 2xy = 3y^4$, where, $y(1) = \frac{1}{2}$

■ **4 - Solve DE using Reduction to separation of variables**

a - $\frac{dy}{dx} = 1 + e^{y-x+5}$