# Adaptive Signal Processing
# Assignment 2

## Note:

- Due date for submission is 11-04-2016.
- There will be 50% penalty for late submission on same day.

**Q. No.1:** Write a Matlab function to implement Wiener Filter with following prototype

**mywiener.m:** A function for following prototype

```
function [w]=wiener(x,d,N);
% Input arguments:
% x = input signal
% d = desired signal
% N = Order of the Wiener Filter

% Output arguments:
% w = Filter taps
```

**Q. No.2:** Write a Matlab function for to compute cost function for 2-tap filter only with following prototype function

```
[J,w1,w2]=jmat(x,d,wo);
% Input arguments:
% x = input signal
% d = desired signal
% wo= Optimal weights

% Output arguments:
% w1 = Ist dimension (like x-axis): 1-D array
% w2 = 2nd dimension (like y-axis) : 1-D array
% J  = 3rd dimension (like z-axis) : 2-D array
```

**Q. No.3:** Write a Matlab script **wrapper.m.**

I. Generate 1000 random samples as x[n].
II. Consider any FIR system h[n] of 11-taps (Its better to initialize a LPF using **sinc()** function).
III. Compute output signal d[n] considering input x[n] and filter h[n] using Matlab's builtin function **filter().**
IV. Compute optimum taps using **mywiener.m.**

**Q. No.4:** Write another Matlab script **plotcost.m**

I. Repeat first 3 steps of last task considering a 2 tap filter h[n]=[2 -3];
II. Compute optimal weights using **mywiener.m.**
III. Compute and plot cost function in 3-D and 2-D as contours using **jmat.m**

**Deliverables** zipped in a single file named assign01-student-name-Reg.No.zip

1. **mywiener.m**
2. **jmat.m**
3. **wrapper.m**
4. **plotcost.m**