**Random Signals and Noise**

**Project 2**

**Report**

**Submitted by:** -Ahmed Omar Zohir 34-2413

-Omar Tarek Khalil 34-3338

**H matrix for n=3:**  H= [-0.0576720748889894 -0.0611656308096264 0.0548865772723150;

-0.0221222078520581 0.0310241484324170 0.0252861497365080]

**Mean Square Error vs path loss exponent (n) with Shadowing variance of 4db:**

**Mean Square Error vs shadowing with path loss exponent n=3:**



**Comments:**

1. The mean square error decreased with the path-loss exponent, since the shadowing is constant in this case so it is logical that increasing the pass loss exponent will result in increased received power relative to the constant shadowing. Hence, lower mean square error value.
2. The mean square error increased with the shadowing standard deviation. The mean of the shadowing is equal to zero and the standard deviation describes how the random values of shadowing are scattered around the zero. Hence, having a standard deviation of zero means values equal to the mean which will render the observation function to be deterministic resulting in mse of zero, while higher standard deviation values will decrease the dependency of the received power (Observation) on the distance (Signal) which in return increase the mean square error.