**KFUPM**-EE DEPT.

EE573- Digital Communications II

**Dr. Ali Muqaibel**

Assignment # 3 Due: Week 9

Compensation for Channel distortion Using Pulse Shaping vs. Equalization

For a binary transmission system with rate =4800 bits/sec over a channel with frequency (magnitude) response $\left|C\left(f\right)\right|=\frac{1}{\sqrt{1+\left(\frac{f}{W}\right)^{2}}}, |f|\leq W$

Where W=4800Hz. Noise is AWGN with zero mean and $\frac{N\_{0}}{2}=10^{-15}\frac{W}{Hz} $

We would like to compensate for the channel using three different alternatives:

* Pre-compensate at the transmitter pulse shaping filter
* Equally compensate between the transmitter and the receiver pulse shaping filters
* Use an equalizer (ZFE)
* Assume non distorting channel

The above problem was considered as an example in the class. Your task is to simulate the communication through the channel and plot the BER performance vs. SNR.

* Plot the simulation results on top of the theoretically derived results for the above four alternatives.
* Equalizer: in a separate plot: vary the length equalizer and study the behavior.
* Discuss and comment on the results

**Bonus:** Try different types of equalizers and compare them to the ZFE.. (MSE, DFB,…)

Every group should submit an MS-word typed solutions+ 5 min presentation to discuss your results. (A new group leader + Team mix)

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