

Submit the project at the beginning of the first lecture on May 13, 2024. (Submit only m-file through Teams by May 13, 2024, 14:30 PM.) No late project is accepted. No online and e-mail submission. Project is supposed to be your individual work, cheating will not be tolerated.

In a baseband communication system, $s_1(t) = \begin{cases} A \sin\left(\frac{2\pi t}{T}\right), & 0 \leq t \leq T/2 \\ 0, & \text{Else} \end{cases}$ and $s_2(t) = -s_1(t - T/2)$ are transmitted for the bits "1" and "0", respectively. Find the bit error rate (BER) expression of this system over additive white Gaussian channel (AWGN) for a) $P(1)=P(0)=1/2$, b) $P(1)=1/4$, $P(0)=3/4$ and plot it. Do the simulation of the system to obtain BER curve versus SNR. Compare and comment on the theoretical and simulated BER curves.

Project must contain analytical derivations, MATLAB code with explanations, BER plots and your comments on them.

In the final exam, there might be a question related to the MATLAB code of this project.