

Student: Ty Davis

Course: ECE 5420

Subject: Programming Assignment 3 - Binary Antipodal Modulation

Date: October 12, 2025

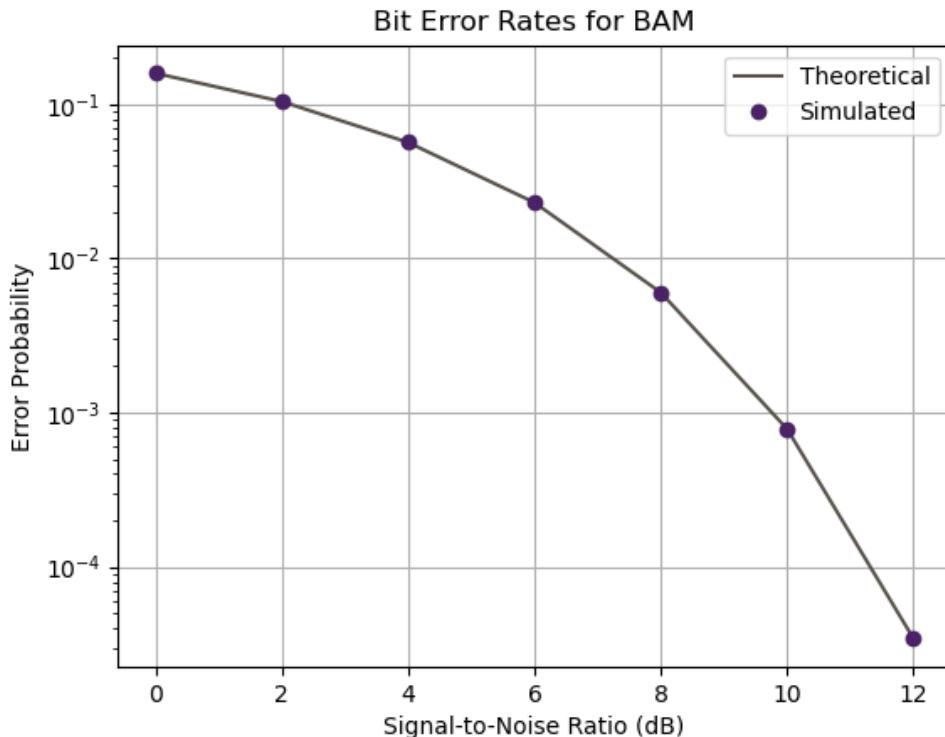


WEBER STATE UNIVERSITY
Engineering, Applied Science & Technology

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The following are the values that I calculated for the assignment.

E_p	1	1	1	1	1	1	1
N_0	2.000	1.262	0.796	0.502	0.317	0.200	0.126
$\frac{E_p}{N_0}$	0.500	0.792	1.256	1.991	3.155	5.000	7.924
$\frac{E_p}{N_0}$ in dB	-3.010	-1.010	0.990	2.990	4.990	6.990	8.990
P_b in Q function	1.000	1.259	1.585	1.995	2.512	3.162	3.981
P_b Theoretical	1.5865E-01	1.0403E-01	5.6495E-02	2.3007E-02	6.0044E-03	7.8270E-04	3.4303E-05
P_b Simulation	1.5766E-01	1.0402E-01	5.6507E-02	2.3001E-02	6.0048E-03	7.8181E-04	3.4137E-05



Output from the Python script:

```
SIM: 1.5866e-01    THEORY: 1.5865e-01
SIM: 1.0402e-01    THEORY: 1.0403e-01
SIM: 5.6507e-02    THEORY: 5.6495e-02
SIM: 2.3001e-02    THEORY: 2.3007e-02
SIM: 6.0048e-03    THEORY: 6.0044e-03
SIM: 7.8181e-04    THEORY: 7.8270e-04
SIM: 3.4137e-05    THEORY: 3.4303e-05
```