

Department of Electrical and Computer Engineering  
University of Massachusetts Dartmouth

ECE544 Fault-Tolerant Computing  
& Reliability Engineering

Fall 2022

Homework #2

Name: \_\_\_\_\_

Instructor: Prof. Liudong Xing

# ECE544: Fault-Tolerant Computing & Reliability Engineering (Fall 2022)

## Homework #2

**Assigned:** September 21, Wednesday

**Due:** September 28, Wednesday, 3:30pm

### Instructions:

1. Please type your answers or write your answers clearly (illegible writing will NOT be graded).
2. Please organize all pages of your answers into **one file**, name your file using “HW1-your last name.pdf or doc” (e.g., HW2-Xing.pdf), and submit it to [lxing@umassd.edu](mailto:lxing@umassd.edu) electronically or submit a hard copy by the due date.

### Problems:

1. How many check bits are needed if the Hamming single error correcting (SEC) code is used to detect single bit errors in a 64-bit data word?
2. Develop a **Hamming SEC code** for a 16-bit data word.
  - 1) Generate the code word for the data word  $D_{16}D_{15}D_{14}\dots D_2D_1=0101000000111001$ .
  - 2) Show that the code will correctly identify an error in data bit  $D_{16}$ .