

Department of Electrical and Computer Engineering
University of Massachusetts Dartmouth

ECE544 Fault-Tolerant Computing
& Reliability Engineering

Fall 2022

Homework #3

Name: _____

Instructor: Prof. Liudong Xing

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

Homework #3

Assigned: September 28, Wednesday

Due: October 5, 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 “HW3-your last name.pdf or doc” (e.g., HW3-Xing.pdf), and submit it to lxing@umassd.edu electronically or submit a hard copy by the due date.
3. Relevant lecture notes: Lecture #5.

Problems:

1. Non-separable Cyclic Code:
 - a) Design a combinatorial circuit that is capable of encoding four-bit information words into **non-separable** cyclic code words using the generator polynomial $G(X)=1+X+X^2+X^5$.
 - b) Show the resulting code word for the data word $(d_3 d_2 d_1 d_0) = (1011)$.
2. Generate the **separable** cyclic code word for the data word $(d_3 d_2 d_1 d_0) = (1011)$ using the generator polynomial $G(X)=1+X+X^2+X^5$.