Possible Topics in Design for Reliability (DfR)

- ✓ How Things Fail
- ✓ Basics Elements of a Reliability Program
- ✓ Mathematical Foundations of Reliability
  - Engineering Statistics / Probability
- ✓ Allocating System Reliability Requirements/Goals
  - Reliability Block Diagrams (RBD)
- ✓ Fault Tree Analysis (FTA)
- ✓ Failure Modes Effects and Criticality Analysis (FMECA)
- ✓ Mean Time Between Failures (MTBF)
- ✓ Robust Design Concepts – Taguchi Methods
- ✓ Designing for Simplicity / Part Minimization Techniques
- ✓ Failure Analysis (FA), FRACAS and Root Cause Analysis (RCA)
- ✓ Reliability Testing Methods
- ✓ Process Capability Studies

  Each of the above bulleted topics could have a short application/exploration associated with it.

- ✓ Possible Reinforcing Case Studies
  - TBD

- ✓ Possible MCCDE "Guitar" Project Tie-ins:
  - Block Diagrams for Electronics
  - FMECA
  - Process Capability Studies

At BC3, there is no single "design" course as we do not currently offer a traditional MET degree. For BC3, these modules would be divided among various courses in our Manufacturing Technology and Computer Aided Drafting programs, as shown below:

MECH-103 Materials and Processes of Manufacturing
MECH-107 Introduction to Manufacturing Systems
DRFT-115 Engineering Graphics
DRFT-110 Advanced Drafting
MECH-281 Manufacturing Capstone Project
MECH-205 Machine Design - CADD

Lecture Hours	Lab Hours	Topic
1	0	How Things Fail
2	0	Basics Elements of a Reliability Program
6	3	Mathematical Foundations of Reliability
2	1	Allocating System Reliability Requirements/Goals
2	1	Fault Tree Analysis
2	2	Failure Modes Effects and Criticality Analysis
1	1	Mean Time Between Failures
3	3	Robust Design Concepts – Taguchi Methods
3	3	Designing for Simplicity / Part Minimization Techniques
2	2	Failure Analysis, FRACAS and Root Cause Analysis
1	0	Reliability Testing Methods
3	2	Process Capability Studies
1	3	Reinforcing Case Study(ies)