LOGM 634 - Homework Set #1

Due 11 January 2017

## From the Ebeling text - Exercise 2.2

A component has the following linear hazard rate, where is in years:

1. Find and determine the probability of a component failing within the first month of its operation.
2. What is the design life is a reliability of is desired?

## From the Ebeling text - Exercise 2.4

The failure distribution is defined by

1. What is the probability of failure within a warranty period?
2. Compute the MTTF
3. Find the design life for a reliability of

## From the Ebeling text - Exercise 2.11

A new fuel injection system is experiencing high failure rates. This reliability function has been found to be

where is measured in years. The reliability over its intended life of yr is , which is unacceptable. Will a burn-in period of months significantly improve upon this reliability? If so, by how much?

## From the Ebeling text - Exercise 3.1

A component experiences chance (CFR) failures with an MTTF of hr. Find the following:

1. The reliability for a -hr mission
2. The design life for a reliability
3. The median time to failure

## From the Ebeling text - Exercise 3.2

A CFR system with has been operating for hr. What is the probability that it will fail in the next hr? The next hr?

# Summary Exercise (30 Points)

A relay circuit has an average failure rate of 4 failures every 3 years. The circuit’s failure times follow an exponential distribution.

1. What is the probability that the circuit will survive for one year without failure?
2. What is the probability that there will be more than two failures in the first year?
3. What is the expected number of failures per year?