

BROOME COMMUNITY COLLEGE  
Binghamton, New York

COURSE TITLE RELIABILITY AND LIFE TESTING SQC 244

CLASS LECTURE HOURS 3 LAB HOURS 0 CREDIT HOURS 3

DIVISION DEAN William Beston

DEPT. CHAIRPERSON Mort Goldberg DATE April 1993

PREREQUISITE: MAT 124 Statistics

**Learning objectives of Course:**

The student should be able to:

1. Explain the basic concepts of reliability
2. Define reliability, life testing, maintainability and availability
3. Discuss organizing for Quality and Reliability
4. Compute the probability of simple and compound events
5. Use the Discrete Probability Distribution such as Binomial, Hypergeometric, Poisson and Pascal to compute related probabilities of events
6. Use continuous distributions such as Normal, Exponential, Gamma, Log-normal and Weibull to solve problems related to reliability of products
7. Compute failure rates, MTBF, MTTF and mean life
8. Compute probability of Survival of Series System Parallel redundant and series-parallel redundant systems
9. Develop life testing plans based on pre-assigned number of failures, preassigned run time and SPRT
10. Explain maintainability and compute MTTR.

**Catalog Course Description:**

SQC 244 - Fundamentals of probability; probability distributions. Discrete distributions: binomial, hypergeometric, Poisson, Pascal. Continuous distributions: normal, exponential, gamma, log-normal, Weibull; Introduction to reliability, failure rate, MTBF, MTTF, mean life, probability of survival for series systems and parallel redundant systems, basics of life testing based on preassigned number of failures and preassigned time, SPRT, maintainability, availability and MTTR.

3 Class Hours; Prerequisite: MAT 124 Statistics

## **SQC 244**

### **RELIABILITY OF LIFE TESTING**

#### **Course Outline**

- I. Introduction
  - A. Concepts of reliability
  - B. Definitions of Reliability
  - C. History and Evaluation
  
- II. Management, Organization and Communication
  - A. Organization
  - B. Supplier Reliability
  - C. Design Review
  - D. Data Collection, Analysis, Corrective Action
  
- III. Introduction to Probability
  - A. Addition and Multiplication Rule
  - B. Independent and dependent events
  - C. Conditional probability
  
- IV. Introduction to Common Probability Distributions
  - A. Discrete distributions
    - Binomial
    - Hypergeometric
    - Poisson
    - Pascal
  - B. Continuous distributions
    - Normal
    - Exponential
    - Gamma
    - Weibull
    - Log-normal
  
- V. Fundamentals of Reliability
  - A. Failure rate
  - B. MTBF, MTTF
  - C. Mean Life
  - D. Probability of Survival
  
- VI. Reliability Life Testing
  - A. Based on Preassigned number of failures
  - B. Based on Preassigned run time
  - C. Sequential Reliability Testing
  
- VII. Maintainability and MTTR
  
- VIII. Availability