

Webinar



# Certified Reliability Engineer

Quality excellence to enhance  
your career and boost your  
organization's bottom line



# 4

Interactive online Sessions to enhance your knowledge  
and prepare you to write the ASQ CRE Examination

The Training will be conducted by **Dr. Joe DeSimone**, He is a renowned instructor who carries more than 20+ years of experience and he is recognised by the ASQ Board.

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## About the Course



The Reliability and Maintainability Engineer understands the principles of performance evaluation and prediction to improve product/systems safety, reliability, and maintainability. The CRE body of knowledge and applied technologies include, but are not limited to, design review and control; prediction, estimation, and apportionment methodology; failure mode and effects analysis; the planning, operation, and analysis of reliability testing and field failures, including mathematical modeling; understanding human factors in reliability; and the ability to develop and administer reliability information systems for failure analysis, design, and performance improvement and reliability program management over the entire product life cycle.

The course is 40 hours in duration and focuses on exam prep and implementation in the workplace. The course will follow the CRE BOK and will follow the sample schedule as shown below. Additionally, each participant will follow a special study plan developed for him / her at the beginning of the course. The study plan will enable participants to follow a personalized plan for studying and preparing and passing the exam.

**Class Procedure:** The method of instruction will be a online class, a detailed coverage of each of the areas in the BOK, followed by a discussion and review of exam type questions. The instructor will make every effort to tailor the instruction so that it relates to the actual exam, as well as how the material is applied to the workplace. Each class session will also allow time to apply the tools and methodologies and the instructor will review progress, providing instruction to each participant.



## Training Details

Topics in this body of knowledge (BoK) include additional detail in the form of subtext explanations and the cognitive level at which the questions will be written. This information will provide useful guidance for both the Examination Development Committee and the candidates preparing to take the exam. The subtext is not intended to limit the subject matter or be all-inclusive of what might be covered in an exam. It is intended to clarify the type of content to be included in the exam. The descriptor in parentheses at the end of each entry refers to the highest cognitive level at which the topic will be tested. A more comprehensive description of cognitive levels is provided at the end of this document.



## Who Should Attend

Commodity Risk Assessment Engineer  
Principal Scientist Product Development Engineer  
Quality Engineer  
Reliability Engineer  
Risk and Reliability Analyst Safety Engineer  
Statistician Systems Engineer Test Engineer  
Validation Engineer  
Practicing engineers  
Quality or reliability managers  
Warranty analysts with engineering functions  
Production/ design engineers  
Maintenance Engineers

## Benefits of Attending the CRE Exam Prep Course

Demonstrate an understanding of the concepts of reliability engineering.

Measure model times to failure using the appropriate probability distribution  
Develop reliability test plans that represent the expected use environment and operational conditions.

Select, analyze, and interpret the results of various test methods to be used during product development and end product testing.

Use probability and statistical tools to analyze product lifecycle, conduct hypothesis testing, understand appropriate statistical models, tolerance and confidence intervals, sample size determination, and regression analysis.

Determine a life test, estimate reliability values from the test data, and set confidence limits on the results.

Measure model times to failure using the appropriate probability distribution.

Demonstrate an understanding of the relationship between the time to failure distribution, the reliability function, and the hazard rate.

Determine a life test, estimate reliability values from the test data, and set confidence limits on the results.

Adding a certification in career for engineers by participating in a 5 days value added learning session.



# Course Topics and Sessions

## Session One

### **Reliability Fundamentals**

#### **A. Leadership Foundations**

1. Benefits of reliability engineering
2. Interrelationship of safety, quality, and reliability
3. Reliability engineer leadership responsibilities
4. Reliability engineer role and responsibilities in the product life cycle
5. Function of reliability in engineering
6. Ethics in reliability engineering
7. Supplier reliability assessments
8. Performance monitoring
9. Organization & Leadership

#### **B. Reliability Foundations**

1. Basic reliability terminology
2. Drivers of reliability requirements and targets
3. Corrective and preventive action (CAPA)
4. Root cause analysis
5. Product life-cycle engineering stages
6. Economics of product maintainability and availability
7. Cost of poor reliability
8. Quality triangle
9. Six Sigma methodologies
10. Systems engineering and integration
11. Business & Management

## Session Two

### **Module II. Risk Management**

#### **A. Identification**

1. Risk management techniques
2. Types of risk

#### **B. Analysis**

1. Fault tree analysis (FTA)
2. Failure mode and effects analysis (FMEA)
3. Common mode failure analysis
4. Hazard analysis
5. Risk matrix
6. System safety

- C. Mitigation **Continued on next page.....**



# Session Two

## **Module III. Probability and Statistics for Reliability**

### **A. Basic Concepts**

1. Basic statistics
2. Basic probability concepts
3. Probability distributions
4. Probability functions
5. Sampling plans for statistics and reliability testing
6. Statistical process control (SPC) and process capability studies (Cp, Cpk)
7. Confidence and tolerance intervals
8. Manufacturing and Process Reliability

### **B. Data Management**

1. Sources and uses of reliability data
2. Types of data
3. Data collection methods
4. Data summary and reporting
5. Failure analysis methods
6. Failure reporting, analysis, and corrective action system (FRACAS)
7. Work Management

# Session Three

## **Module IV. Reliability Planning, Testing, and modeling**

### **A. Planning**

1. Reliability test strategies
2. Environmental and conditions of use factors
3. Failure consequence
4. Failure criteria
5. Test environment

### **B. Testing**

1. Accelerated life tests
2. Stress screening
3. Qualification/ Demonstration testing
4. Degradation
5. Software testing

### **C. Modelling**

1. Reliability block diagrams and models
2. Physics of failure and failure mechanisms





## **Module III. Probability and Statistics for Reliability**

### **A. Basic Concepts**

## **Module V. Life-Cycle Reliability**

### **A. Reliability Design Techniques**

1. Design evaluation techniques (validation and verification)
2. Stress-strength analysis
3. Design of experiments (DOE)
4. Reliability optimization
5. Human factors
6. Design for X (DFX)
7. Design for Reliability (DFR)
8. Equipment Reliability

### **B. Parts and Systems Development**

1. Materials and components selection techniques
2. Parts standardization and system simplification

### **C. Maintainability**

1. Preventive maintenance (PM) analysis  
Corrective maintenance analysis

## **Qualifications and Requirements for CRE Certification**

Candidates must have eight years of on-the-job experience in one or more of the areas of the Certified Reliability Engineer Body of Knowledge.

### **Education**

Candidates who have completed a degree from a college, university, or technical school can waive some part of the eight-year experience requirement as follows (only one of these waivers may be claimed)

- Diploma from a technical or trade school— one year waived
- Associate's degree—two years waived
- Bachelor's degree—four years waived
- Master's or doctorate degree—five years waived

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# Trainers Profile

## Dr. Joe DeSimone

Experienced Trainer and Consultant with a demonstrated history of working in the Professional Training and Consulting industry. Skilled in DMAIC, ISO 14001, Reliability, CRE, CQE, SSBB, Root Cause Analysis, Continuous Improvement, and ISO Standards. Strong research professional with a Phd. focused in DBA - Adult Education from Concordia University.



He is involved in providing many clients with Quality and Productivity Training and Consulting since 1989.

He covers a broad scope of specialties including Lean Six Sigma, GD&T, Project Management, ASQ Review Courses, Reliability Assessment, APQP, SPC Implementation, DOE, and Statistical Studies including Court Depositions. Dr. Joe has been active with ASQ for over 20 years, and is past Chair of Section 0700, and most of us know him for his dynamic presentations and conducting of ASQ Review courses for CQE, CRE, SSBB, etc... Joe holds Phd, MS, BS and AS degrees.

**Webinar Fee \$1500 per Participant**

For Two Participants 5% Discount

For Three Participants 10% Discount

For Four Participants 15% Discount

For Five and above Participants 20% Discount