

## 17HS042 Quality and Reliability

### Course Description and Objectives:

To present a problem oriented in depth knowledge of Quality and Reliability and to make students understand and appreciate the importance of quality control and reliability analysis in industrial systems. Students can get acquainted with different reliability calculations models.

### Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Understand the concepts of statistical quality control, improvement and management.
2	Understand the concept of design for quality.
3	Understand the concept of reliability.
4	Understand and carry out reliability data analysis.
5	Get acquainted with various reliability prediction and evolution methods.

### Skills:

1. Construct R charts to variables.
2. Evaluation of sampling plan, scopes.
3. Apply and extend the techniques of Hazard function, estimation of reliability, exponential distribution as life model and its memoryless property.

### Unit-I

Importance of SQC in industry, statistical basis of shewart control charts, uses of control charts. Interpretation of control charts, control limits, Natural tolerance limits and specification limits.

### Unit – II

Variable Control Chart: Construction of  $\bar{X}$ , R charts for variables, Attribute control charts- NP, P charts, C chart.

### Unit-III

Acceptance sampling plans: Scope, Producer's risk and consumer's risk . Concepts of AQL and LTPD.

#### **Unit-IV**

Sampling Plans: Single and double sampling plans, OC and ASN functions, Double and single

Sampling plans for attributes using Binomial.

#### **Unit-V**

Reliability: Introduction, failure rates, Hazard function, estimation of reliability, exponential distribution as life model, its memoryless property.

#### **Text Books:**

1. BA/BSc III year paper - IV Statistics - applied statistics - Telugu academy by Prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.
2. Fundamentals of applied statistics : VK Kapoor and SC Gupta
3. S.K Sinha: Reliability and life testing. Wiley Eastern.

#### **Reference Books:**

1. R.C. Gupta: Statistical Quality Control.