

# UNDERGRADUATE PROGRAMME IN INSTRUMENTATION

ELI -7

## Quality Control Techniques

48 Periods

### UNIT 1

Quality Concepts: Meaning of Quality, Approaches- Deming's Approach, Juran's Approach, Quality of Product, Quality of Service, Cost of Quality, Value of Quality, Difference between Inspection, Quality Control and Quality Assurance, Evaluation of Quality control, Quality Improvement Techniques Pareto Diagrams, Cause-Effect Diagrams Quality Circles, Kaizen, six sigma  
12 Periods

### UNIT 2

Control Charts: Chance and assignable causes, Statistical Basis of the Control Charts (basic principles, choices of control limits, sample size and sampling frequency, rational subgroups, analysis of pattern on control charts, warning limits, ARL, sensitizing rules for control charts, Control Charts for X-bar & R (statistical basis, development and use, estimating process capability; interpretation, the effect of non-normality on the chart, the OC function, average run length and control chart for attribute (p, np, c )  
14 Periods

### UNIT 3

Acceptance Sampling: Meaning, objective, and types of research, approaches, Principle of acceptance sampling, Producer's and consumer's risk. AOQL and LTPD, Sampling plans – single, double, O C curve  
12 Periods

### UNIT 4

Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation, Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – Case studies of TQM implementation in manufacturing and service sectors.  
10 Periods

### Essential Books:

#### UNIT 1

Chapter -1, 2, 3 - Janakiraman, B and Gopal, R.K, - Total Quality Management – Text and Cases, Prentice Hall (India) Pvt. Ltd., 2006.

#### UNIT 2

Chapter -5, 6 - D. C. Montgomery , Introduction to Statistical Quality Control, 4th edition 2001, John Wiley and sons

#### UNIT 3

Chapter-14 - D. C. Montgomery, Introduction to Statistical Quality Control, 4th edition 2001, John Wiley and sons

#### UNIT 4

Appendix A and B- Janakiraman, B and Gopal, R.K, - Total Quality Management – Text and Cases, Prentice Hall (India) Pvt. Ltd., 2006.

Quality manuals of leading Industries (for case studies)

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### Suggested Books:

1. Dale H. Besterfield, et al.,- Total Quality Management, Pearson Education Asia, Third Edition, Indian Reprint (2006).
2. John Pike and Richard Barnes, TQM in action, A practical approach to continuous performance improvement, Chapman and Hall
3. E.L.Grant and R.S. Leavenworth-Statistical Quality Control, 6th edition McGraw Hill International editions
4. Kaoru Ishikawa-Guide to Quality Control, Asian Productivity Organization
5. Jerry Banks –Principles of Quality Control, Wiley publisher.
6. James R. Evans and William M. Lindsay, The Management and Control of Quality, 6th Edition, South-Western (Thomson Learning), 2005.
7. Oakland, J.S. -TQM – Text with Cases, Butterworth – Heinemann Ltd., Oxford, 3rd Edition, 2003.
8. Suganthi,L and Anand Samuel, Total Quality Management, Prentice Hall (India) Pvt. Ltd.,2006.

### Practical (based on ELI -7)

(Using latest statistical software)

1. Collection, tabulation and statistical interpretation of data.
2. Construction & analysis of X-bar and R Chart
3. Construction and analysis of p, np and 'c' charts
4. Construction and analysis of OC curves
5. Computing and analyzing LTPD, AOQL graphically
6. Designing and implementing sampling plans
7. Implementation of TQM at industry level(based on case study)
8. Implementation of ISO 9000/ISO 14000 at industry level(based on case study)