
# DIRECTORATE OF TECHNICAL EDUCATION

# DIPLOMA IN MECHANICAL ENGINEERING

M SCHEME

2015 -2016 onwards

III YEAR

V SEMESTER

ELECTIVE THEORY

**32071 – TOTAL QUALITY MANAGEMENT**

CURRICULUM DEVELOPMENT CENTRE

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

**Course Name** : DIPLOMA IN MECHANICAL ENGINEERING

**Course Code** : 1020

**Subject Code** : 32071

**Semester** : V

**Subject Title** : TOTAL QUALITY MANAGEMENT

**TEACHING AND SCHEME OF EXAMINATIONS:**

No. of Weeks per Semester: 15 Weeks

| Subject | Instructions | | Examination | | | |
|---|---|---|---|---|---|---|
| | Hours/ Week | Hours/ Semester | Marks | | | Duration |
| Total Quality Management | 5 | 75 | Internal Assessment | Board Examination | Total | 3 Hrs |
| | | | 25 | 75 | 100 | |

**Topics and Allocation of Hours:**

| Unit | Topics | Hours |
|---|---|---|
| I | Basic Concepts of Total Quality Management | 14 |
| II | Continuous process improvement – Q-7 Tools | 14 |
| III | Statistical Fundamentals | 14 |
| IV | Control charts | 13 |
| V | Management Planning tools & Bench marking | 13 |
| | REVISION AND TEST | 7 |
| | **Total** | **75** |

**RATIONALE:**

Quality and customer satisfaction in every product and every activity is the order of the day. As there is a shift from quality control to quality management in all activities, the concept Total Quality Management and the pillars of TQM are to be given to Engineers, who are designing products and production systems.

**OBJECTIVES:**

- Define quality and appreciate its signature.
- Explain the concept of TQM.
- Appreciate the use of principles of TQM to meet customer satisfaction.
- Solve problem using the Quality control tools.
- Apply Brainstorming and quality circle to solve problems.
- Use PDCA cycle for continuous improvement.
- Appreciate the benefits of implementing 5S concepts.
- Collect, classify and present the data.
- Determine the process capability of a manufacturing process.
- Practice on management planning tools.
- Use Bench Mark and JIT concepts.

## TOTAL QUALITY MANAGEMENT

## DETAILED SYLLABUS

**Contents: Theory**

| Unit | Name of the Topic | Hours |
|---|---|---|
| I | **BASIC CONCEPTS OF TOTAL QUALITY MANAGEMENT**<br>Quality-Definitions - Dimensions of quality - Brainstorming and its objectives - Introduction to TQM – Characteristics – Basic concepts – Elements – Pillars – Principles - Obstacles to TQM implementation – Potential benefits of TQM – Quality council – Duties – Responsibilities – Quality statements – Vision – Mission – Quality policy statements – Strategic planning – Seven steps to strategic planning – Deming philosophy- Customer delight - ISO 9001:2008 Quality Management System requirements and implementation. | 14 |
| II | **CONTINUOUS PROCESS IMPROVEMENT – Q7 TOOLS**<br>Input / Output process model – Juran Trilogy – PDCA (Deming Wheel) cycle – 5S Concepts – SEIRI, SEITON, SEISO, SEIKETSU and SHITSUKE – needs and objectives – effective implementation of 5S concepts in an organisation - Housekeeping – Kaizen.<br>Seven tools of quality control (Q-7 tools) – Check sheet – Types of | 14 |

check sheet – Histogram – Cause and effect diagram - Pareto diagram – Stratification Analysis – Scatter diagram-Graph/run charts – Control charts - Construction of above diagrams.

Quality circle - concept of quality circle - Organisation of Quality circle and objectives of Quality circle.

**III STATISTICAL FUNDAMENTALS** **14**

Types of Data – Collection of Data – Classification of Data – Tabular presentation of Data – Graphical representation of a frequency distribution – Comparison of Frequency distribution – Mean – Median – Mode – Comparison of measures of central tendency – Introduction to measures of dispersion – Sample – sampling - Normal curve – Sigma – Concept of six sigma – Principles – Process- Problems.

**IV CONTROL CHARTS** **13**

Control chart – Types of control charts – Control chart for variables – Construction of X and R charts – control limits Vs specification limits – Process capability – Method of doing process capability Analysis – Measures of process capability – Problems.

Attributes – Control charts – P chart – np chart – c chart – u chart – Construction of above diagrams – Problems - Comparison between variable chart and Attribute chart.

**V MANAGEMENT PLANNING TOOLS & BENCH MARKING** **13**

Affinity diagram – Radar Diagram - Inter Relationship diagram (Inter Relationship diagram) – Tree diagram - Prioritization matrix – Matrix diagram – Decision tree – Arrow diagram – Matrix data analysis diagram - Construction of above diagrams.

Bench marking – Objectives of bench marking – Types – Bench marking process - Benefits of Bench marking – Pit falls of Bench marking-Just In Time(JIT) concepts and its objectives - Total Productive Maintenance(TPM) - Introduction, Objectives of TPM - steps in implementing TPM.

**Text Book:**


1) Total Quality Management, Date H.Besterfiled, Pearson Education Asia.
2) Total Quality Management, V.Jayakumar, Lakshmi Publications.(reprint 2005)
3) Training manual on ISO 9001 : 2000 & TQM, Girdhar J.Gyani, Raj Publishing House, Second Edition 2001
4) Quality Management, Howard Cuitlow, Tata Mc Graw Hill, 1998


**Reference Book:**


1) Total Quality Management, Oakiand.J.S. Butterworth Heinemann Ltd. Oxford 1989.
2) Quality Management – Concepts and Tasks- Narayana.V and Sreenivasan.N.S., New Age International 1996.
3) Total Quality Management for engineers, Zeiri. Wood Head Publishers. 1991.
4) Quality Planning and Analysis, Juran J.M and Frank M.Gryna Jr., TMH. India. 1982
5) ISO 9001, Brain Rethry, Productivity and Quality Publishing Pvt. Ltd. 1993.
6) Quality Auditing D.Mills, Chapman and Hall, 1993.