# ICTQual AB

## Qualification Specification

# ICTQual AB Level 5 Diploma in Quality Control Mechanical

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# ICTQual AB's

# Level 5 Diploma in Quality Control Mechanical

## Contents

# Qualification Specification about

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## About ICTQual AB's

ICTQual AB is a distinguished awarding body based in the United Kingdom, dedicated to fostering excellence in education, training, and skills development. Committed to global standards, ICTQual AB's provides internationally recognized qualifications that empower individuals and organizations to thrive in an increasingly competitive world. Their offerings span diverse industries, including technical fields, health and safety, management, and more, ensuring relevance and adaptability to modern workforce needs.

ICTQual AB's delivers high-quality educational solutions through a network of Approved Training Centres worldwide. Their robust standards and innovative teaching methodologies equip learners with practical knowledge and skills for personal and professional growth. With a mission to inspire lifelong learning and drive positive change, ICTQual AB's continuously evolves its programs to stay ahead of industry trends and technological advancements.

## Course Overview

The Level 5 Diploma in Quality Control – Mechanical provides advanced theoretical knowledge and practical skills essential for maintaining and improving quality standards in mechanical systems and manufacturing environments. This qualification focuses on key areas such as quality planning, inspection and testing methods, documentation and reporting, and continuous quality improvement techniques used in mechanical industries. Learners will engage with technical concepts, industry regulations, and internationally accepted quality practices that support effective control and assurance of mechanical products and processes. Emphasis is placed on standards compliance, defect analysis, statistical quality tools, non-destructive testing methods, and management of quality systems aligned with international benchmarks. The programme is designed to equip individuals with the competencies required to take ownership of quality assurance responsibilities, conduct thorough inspections, interpret engineering documentation, and contribute to the strategic improvement of mechanical systems and components.

**Course Aim:**

The aim of this diploma is to prepare learners for technical and supervisory roles within mechanical quality control systems. It intends to develop their ability to apply advanced quality techniques, ensure compliance with applicable standards, and contribute meaningfully to quality improvement and operational efficiency across mechanical engineering processes.

**Target Audience:**

- Individuals working in or seeking employment in mechanical engineering and manufacturing sectors.
- Technicians and supervisors responsible for quality control and assurance in mechanical production.
- Engineers and inspectors aiming to enhance their understanding of quality systems and inspection protocols.
- Professionals transitioning from general engineering roles to specialised quality functions.
- Learners seeking a formal qualification to validate their skills in mechanical quality control.

**Standards & Objectives:**

The qualification aligns with industry-specific standards and job-role expectations in mechanical quality control. It supports learners in:

- Understanding quality systems, mechanical tolerances, and engineering specifications.
- Applying advanced inspection and testing methods to mechanical components and assemblies.
- Evaluating process compliance, identifying non-conformities, and implementing corrective actions.
- Interpreting technical drawings, product standards, and regulatory requirements.
- Leading continuous quality improvement initiatives and ensuring quality objectives are met throughout mechanical production cycles.

This diploma provides a structured path for professional growth, enabling learners to gain credibility and competence in the mechanical quality control domain.

## Certification Framework

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|---|---|
| **Qualification title** | **ICTQual AB Level 5 Diploma in Quality Control Mechanical** |
| **Course ID** | QC0013 |
| **Grading Type** | Pass / Fail |
| **Competency Evaluation** | Coursework / Assignments / Verifiable Experience |
| **Assessment** | The assessment and verification process for ICTQual AB's qualifications involves two key stages:<br><br>**Internal Assessment and Verification:**<br>✓ Conducted by the staff at the Approved Training Centre (ATC) to ensure learners meet the required standards through continuous assessments.<br>✓ Internal Quality Assurance (IQA) is carried out by the centre's IQA staff to validate the assessment process.<br>**External Quality Assurance:**<br>✓ Managed by ICTQual AB's verifiers, who periodically review the centre's assessment and IQA processes.<br>Verifies that assessments are conducted to the required standards and ensures consistency across centres |

## Entry Requirements

To enroll in the ICTQual AB Level 5 Diploma in Quality Control Mechanical, learners must meet the following requirements:

- **Minimum Age:** Learners must be at least 18 years old
- **Educational Background:** A Level 4 qualification in Mechanical Engineering, Quality Control, or a closely related technical field is recommended
- **Relevant Experience:** A minimum of 1 year of practical experience in mechanical quality control, inspection, or a related engineering environment
- **Technical Knowledge:** Familiarity with core mechanical concepts such as measurement techniques, material properties, and mechanical systems
- **Communication Skills:** Ability to clearly interpret and communicate technical data, procedures, and quality documentation
- **Safety Awareness:** Commitment to workplace health, safety standards, and compliance procedures

These entry requirements are designed to prepare learners for the technical and practical demands of the course, supporting their development into skilled mechanical quality control professionals.

## Qualification Structure

This qualification comprises 10 mandatory units. Candidates must successfully complete all mandatory units to achieve the qualification.

| Mandatory Units | |
|---|---|
| **Unit Ref#** | **Unit Title** |
| QC0013-01 | Advanced Mechanical Quality Control Systems and Methodologies |
| QC0013-02 | ISO Standards and International Mechanical Compliance Frameworks |
| QC0013-03 | Precision Measurement Techniques and Calibration Procedures |
| QC0013-04 | Non-Destructive Testing (NDT) Techniques and Applications |
| QC0013-05 | Quality Control in Welding, Fabrication, and Assembly Operations |
| QC0013-06 | Root Cause Analysis and Corrective/Preventive Action Planning (CAPA) |
| QC0013-07 | Statistical Process Control (SPC) and Quality Data Analysis |
| QC0013-08 | Quality Planning and Auditing in Mechanical Engineering Projects |
| QC0013-09 | Integration of Quality Control with Lean Manufacturing and Six Sigma |
| QC0013-10 | Leadership and Supervisory Skills in Mechanical Quality Management |

## Centre Requirements

To ensure quality training delivery, centres must adhere to the following standards:

**1. Centre Approval**

- ✓ Centres must be formally approved by ICTQual AB's before delivering this qualification.
- ✓ Approval involves a review of facilities, policies, and staff qualifications.

**2. Qualified Staff**

- ✓ **Tutors:** Must hold relevant academic credentials (minimum Level 6 qualification) in mechanical engineering or a related discipline.
- ✓ **Assessors:** Must hold a recognized assessor qualification (e.g., CAVA, AVRA) or equivalent)
- ✓ **Internal Quality Assurers (IQAs):** Must hold a recognized IQA qualification (e.g. Level 4 Award in the IQA and Level 4 Certificate in Leading the IQA) and experience to oversee assessment standards.

**3. Learning Facilities**

**Centre must offer:**

- ✓ Private study areas and internet-enabled workspaces (for blended or physical delivery)
- ✓ Academic and pastoral support for learners
- ✓ Administrative support must be available to manage enrolment, tracking, and learner queries efficiently

**4. Health and Safety Compliance**

- ✓ All training facilities must comply with health and safety regulations.
- ✓ Centres must conduct regular risk assessments for practical activities.

**5. Learning Resources**

- ✓ **Course Materials:** Approved textbooks, study guides, and digital content must align with the qualification standards.
- ✓ **Assessment Tools:** Templates and guidelines must be provided to ensure standardized evaluation processes.
- ✓ **E-Learning Support:** Centres offering online or blended learning must implement an effective Learning Management System (LMS).

**6. Assessment and Quality Assurance**

- ✓ Centres must ensure assessments meet ICTQual AB's competency standards.
- ✓ Internal quality assurance (IQA) must be conducted to maintain consistency.
- ✓ External verifiers from ICTQual AB's will review assessment and training practices.

**7. Learning Support**

- ✓ **Qualification Guidance:** Support for coursework and assignments.
- ✓ **Career Pathway Assistance:** Information on progression opportunities in sustainability and energy sectors.
- ✓ **Accessibility Support:** Accommodations for learners with disabilities or language barriers.

**8. Policies and Compliance**

Centres must uphold the following policies in accordance with ICTQual AB's standards:

- ✓ Equality, Diversity, and Inclusion Policy.
- ✓ Health and Safety Policy.
- ✓ Safeguarding and Learner Protection Policy.
- ✓ Complaints and Appeals Procedure.
- ✓ Data Protection and Confidentiality Policy.

**9. Reporting Requirements**

- Centres must provide ICTQual AB's with regular reports on learner registrations, progress, and certification outcomes.
- Assessment records must be maintained for external auditing and quality assurance purposes.

## Support for Candidates

Centres should ensure that materials developed to support candidates:

- ✓ Facilitate tracking of achievements as candidate's progress through the learning outcomes and assessment criteria.
- ✓ Include information on how and where ICTQual AB's policies and procedures can be accessed.
- ✓ Provide mechanisms for Internal and External Quality Assurance staff to verify and authenticate evidence effectively.

This approach ensures transparency, supports candidates' learning journeys, and upholds quality assurance standards.

## Assessment

This qualification is competence-based, requiring candidates to demonstrate proficiency as defined in the qualification units. The assessment evaluates the candidate's skills, knowledge, and understanding against the set standards. Key details include:

1. **Assessment Process:**

   - ✓ Must be conducted by an experienced and qualified assessor.
   - ✓ Candidates compile a portfolio of evidence that satisfies all learning outcomes and assessment criteria for each unit.

2. **Types of Evidence:**

   - ✓ Observation reports by the assessor.
   - ✓ Assignments, projects, or reports.
   - ✓ Professional discussions.
   - ✓ Witness testimonies.
   - ✓ Candidate-produced work.
   - ✓ Worksheets.
   - ✓ Records of oral and written questioning.
   - ✓ Recognition of Prior Learning (RPL).

3. **Learning Outcomes and Assessment Criteria:**

   - ✓ **Learning Outcomes:** Define what candidates should know, understand, or accomplish upon completing the unit.
   - ✓ **Assessment Criteria:** Detail the standards candidates must meet to demonstrate that the learning outcomes have been achieved.

This framework ensures rigorous and consistent evaluation of candidates' competence in line with the qualification's objectives.

## Unit Descriptors

### QC0013-01- Advanced Mechanical Quality Control Systems and Methodologies

This unit helps learners understand complex quality control systems used in mechanical engineering. It explains how different methods are applied to check and improve the quality of products and processes. Learners will study the use of inspection plans, control charts, and process capability analysis. They will also learn how to manage quality across multiple departments and systems in a manufacturing environment.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Analyse and apply advanced mechanical quality control systems used in industrial environments.** | 1.1 Identify and compare various advanced mechanical quality control systems used across industries.<br>1.2 Analyse how quality control systems align with operational requirements and product specifications.<br>1.3 Demonstrate the integration of quality control systems within the production lifecycle.<br>1.4 Apply systems thinking to evaluate process flow and control points.<br>1.5 Document procedures for implementing a selected quality control model in a live environment.<br>1.6 Evaluate the effectiveness of existing mechanical quality systems through performance data.<br>1.7 Recommend modifications to existing systems based on operational challenges. |
| **2. Evaluate methodologies for improving product quality and reducing variability.** | 2.1 Review different quality improvement models such as Six Sigma, PDCA, and TQM.<br>2.2 Assess the role of process mapping in identifying quality issues.<br>2.3 Evaluate tools such as cause-and-effect diagrams and FMEA for variability reduction.<br>2.4 Compare the impact of reactive vs. proactive methodologies on quality outcomes.<br>2.5 Develop case-based evaluation of defect reduction techniques.<br>2.6 Justify selection of a specific methodology based on product and process characteristics. |
| **3. Implement integrated systems to ensure continuous quality improvement.** | 3.1 Develop an implementation plan for a continuous improvement initiative.<br>3.2 Integrate feedback mechanisms within the system to detect recurring issues.<br>3.3 Align quality improvement systems with KPIs and organisational goals. |

3.4 Monitor system output through real-time data and performance dashboards.
3.5 Assess integration challenges between departments and propose solutions.
3.6 Validate system performance using performance indicators and feedback loops.
3.7 Recommend adjustments to support long-term sustainability of quality improvements.
3.8 Document lessons learned and future improvement opportunities.

### QC0013-02- ISO Standards and International Mechanical Compliance Frameworks

In this unit, learners explore international quality standards, especially ISO 9001, and how these apply to mechanical industries. It explains the importance of following these standards to meet legal and customer requirements. Learners will understand how to align company practices with compliance rules and how to prepare documents and systems for certification audits.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Interpret and apply relevant ISO and international mechanical standards.** | 1.1 Interpret clauses from ISO 9001, ISO 14001, and ISO 45001 relevant to mechanical settings.<br>1.2 Translate standard requirements into mechanical production procedures.<br>1.3 Justify standard selection based on mechanical product type and industry sector.<br>1.4 Apply relevant terminology and structure of international standards in internal documentation.<br>1.5 Demonstrate implementation of quality management principles into mechanical operations.<br>1.6 Verify conformance to ISO clauses using workplace evidence.<br>1.7 Maintain version control and document control according to compliance norms. |
| **2. Assess mechanical systems for compliance with global regulatory frameworks.** | 2.1 Identify applicable mechanical regulations and statutory requirements.<br>2.2 Conduct a compliance audit of a mechanical process using a checklist.<br>2.3 Review and assess documentation for legal and regulatory adherence.<br>2.4 Prepare compliance gap analysis for mechanical equipment or operations.<br>2.5 Recommend necessary changes to processes or materials to meet legal expectations.<br>2.6 Report non-compliances and propose corrective actions with deadlines.<br>2.7 Establish a monitoring system to prevent future non-compliance. |

3. **Develop quality control procedures aligned with international benchmarks.**

3.1 Draft detailed SOPs and inspection checklists based on ISO benchmarks.
3.2 Design acceptance criteria using international mechanical tolerances.
3.3 Integrate customer-specific requirements into global compliance standards.
3.4 Develop verification protocols for key quality control checkpoints.
3.5 Set up documentation systems for traceability and audit readiness.
3.6 Evaluate risks in procedure implementation and propose controls.

### QC0013-03- Precision Measurement Techniques and Calibration Procedures

This unit covers how to carry out accurate measurements on mechanical parts using tools such as micrometres, vernier calipers, and gauges. Learners will study how to set up and use these tools correctly and how to check their accuracy. The unit also explains how calibration is done and why it is important to keep measuring instruments reliable.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| 1. **Operate advanced precision measuring instruments for mechanical components.** | 1.1 Select appropriate instruments for various component types and tolerances.<br>1.2 Demonstrate correct setup and calibration of precision tools.<br>1.3 Perform measurements in accordance with technical drawings.<br>1.4 Record and interpret readings with high precision.<br>1.5 Evaluate instrument suitability based on measuring conditions.<br>1.6 Identify and resolve common measurement errors. |
| 2. **Execute calibration procedures to ensure measurement accuracy and reliability.** | 2.1 Follow standard calibration procedures using traceable equipment.<br>2.2 Log and report calibration results with uncertainty calculations.<br>2.3 Establish calibration intervals based on tool usage and tolerance levels.<br>2.4 Compare results to national or international standards.<br>2.5 Identify instruments requiring adjustment or replacement.<br>2.6 Maintain calibration certificates and tool history records.<br>2.7 Recommend improvements to calibration schedules. |
| 3. **Establish measurement systems analysis (MSA) for mechanical quality processes.** | 3.1 Conduct Gage R&R studies and interpret results.<br>3.2 Evaluate repeatability and reproducibility of selected instruments.<br>3.3 Analyse operator influence on measurement variation.<br>3.4 Implement systems to reduce measurement uncertainty.<br>3.5 Use statistical software to support MSA reporting. |

3.6 Compare measurement system performance across different operations.
3.7 Establish control plans based on MSA findings.
3.8 Present findings to technical and non-technical stakeholders.

### QC0013-04- Non-Destructive Testing (NDT) Techniques and Applications

This unit teaches learners how to check the quality of materials and parts without damaging them. It includes different NDT methods such as ultrasonic testing, magnetic particle inspection, dye penetrant testing, and radiography. Learners will understand when and how to use each method and how to interpret test results safely and correctly.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Apply advanced NDT methods such as ultrasonic, radiographic, and magnetic particle testing.** | 1.1 Select appropriate NDT techniques based on material type and defect nature.<br>1.2 Set up and calibrate NDT equipment following safety procedures.<br>1.3 Apply ultrasonic, radiographic, and magnetic particle testing on complex components.<br>1.4 Comply with radiation and safety protocols during testing.<br>1.5 Interpret signals, images, or patterns to locate discontinuities.<br>1.6 Verify test reliability through repeatability trials.<br>1.7 Document testing procedures and results in accordance with industry standards. |
| **2. Evaluate component integrity using non-invasive inspection techniques.** | 2.1 Define acceptance and rejection criteria based on component specifications.<br>2.2 Analyse test data to assess potential risks and mechanical weaknesses.<br>2.3 Assess the impact of detected flaws on product performance.<br>2.4 Justify decision-making for part rejection or rework.<br>2.5 Compare the effectiveness of different NDT methods for various defect types.<br>2.6 Develop inspection schedules for high-risk components.<br>2.7 Produce technical reports and summaries for engineering teams. |
| **3. Interpret NDT results and integrate findings into quality assessments.** | 3.1 Correlate NDT findings with dimensional inspection and process history.<br>3.2 Assess test outcomes in the context of production performance.<br>3.3 Integrate NDT reports into final quality control documentation.<br>3.4 Recommend design, material, or process changes based on defect trends. |

3.5 Present findings to cross-functional teams for resolution planning.
3.6 Identify root causes for recurring NDT-detected faults.
3.7 Implement a system for trend monitoring based on inspection data.

### QC0013-05- Quality Control in Welding, Fabrication, and Assembly Operations

Learners will explore how to check and control the quality of welding, metal fabrication, and mechanical assembly work. The unit includes inspection of weld joints, checking for defects, understanding tolerances, and reviewing assembly standards. Learners will also study material specifications and work procedures used in workshops and on production lines.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Inspect and assess quality parameters in welding and fabrication processes.** | 1.1 Perform visual inspection and dimensional checks on welds and fabrications.<br>1.2 Identify defects such as porosity, cracks, undercuts, and misalignments.<br>1.3 Verify weld joint designs and WPS (Welding Procedure Specifications).<br>1.4 Record welding inspection results using approved formats.<br>1.5 Evaluate compliance against welding codes and standards.<br>1.6 Recommend rework or repair based on inspection criteria. |
| **2. Monitor assembly operations for compliance with mechanical quality standards.** | 2.1 Develop inspection checklists for mechanical assembly stages.<br>2.2 Monitor fit, alignment, torque, and fastening requirements.<br>2.3 Verify correct usage of materials, tools, and fastening sequences.<br>2.4 Identify quality-critical points in the assembly line.<br>2.5 Record process compliance using sampling plans.<br>2.6 Implement corrective actions for non-compliant assemblies.<br>2.7 Provide feedback for process and design improvements. |
| **3. Identify common defects and ensure process conformance in production.** | 3.1 Classify defects by type, severity, and frequency.<br>3.2 Analyse production process data to detect trends in defect occurrence.<br>3.3 Create visual defect libraries for operator awareness.<br>3.4 Collaborate with technicians to revise SOPs for better conformance.<br>3.5 Validate revised processes through controlled trials. |

3.6 Assess process capability indices (Cp, Cpk) to ensure compliance.
3.7 Audit production areas for ongoing adherence to quality protocols.

## QC0013-06- Root Cause Analysis and Corrective/Preventive Action Planning (CAPA)

This unit focuses on finding and solving quality problems. Learners will study how to investigate the root cause of faults using techniques like the "5 Whys" and fishbone diagrams. The unit also teaches how to plan and record corrective actions to fix problems and preventive actions to stop them from happening again.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Conduct thorough root cause analysis using structured problem-solving tools.** | 1.1 Apply tools such as 5 Whys, Ishikawa diagram, and fault tree analysis.<br>1.2 Collect and organise data related to non-conformance.<br>1.3 Distinguish between symptoms and true root causes.<br>1.4 Prioritise root causes using risk and impact assessment.<br>1.5 Facilitate cross-functional RCA discussions.<br>1.6 Document findings using structured RCA reports.<br>1.7 Develop flowcharts mapping the fault sequence. |
| **2. Develop and implement effective CAPA strategies to eliminate recurring issues.** | 2.1 Define clear, measurable corrective actions linked to root causes.<br>2.2 Plan implementation using timeframes, responsible persons, and resources.<br>2.3 Integrate CAPA into existing quality systems and workflows.<br>2.4 Evaluate effectiveness of implemented actions over time.<br>2.5 Ensure preventive actions target system-wide vulnerabilities.<br>2.6 Conduct follow-up assessments and verification audits.<br>2.7 Maintain CAPA logs with proper version control. |
| **3. Monitor the impact of corrective actions on mechanical process improvement.** | 3.1 Track key metrics before and after CAPA implementation.<br>3.2 Evaluate reduction in defect rates and non-conformances.<br>3.3 Identify secondary issues arising from implemented changes.<br>3.4 Report performance improvements using charts and KPIs. |

3.5 Engage team members in post-CAPA reviews.
3.6 Refine CAPA procedures based on real-world feedback.
3.7 Embed CAPA evaluation into continuous improvement plans.

### QC0013-07- Statistical Process Control (SPC) and Quality Data Analysis

In this unit, learners will understand how to collect and analyse data from production processes. They will learn how to use statistical tools such as control charts, histograms, and trend analysis to monitor quality. The unit explains how data is used to detect problems early and improve decision-making in quality control.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| 1. **Utilise SPC tools to monitor and control mechanical manufacturing processes.** | 1.1 Set control limits based on historical process data.<br>1.2 Select and construct appropriate control charts based on the nature of the quality data and process characteristics.<br>1.3 Distinguish between common and special cause variation.<br>1.4 Interpret chart signals for process stability.<br>1.5 Alert operators to take corrective actions based on SPC charts.<br>1.6 Monitor real-time data using control software tools.<br>1.7 Conduct run charts to track short-term variability. |
| 2. **Analyse quality data to identify trends, process variations, and potential risks.** | 2.1 Collect data using structured formats and sampling plans.<br>2.2 Apply histograms, Pareto charts, and scatter plots to spot trends.<br>2.3 Correlate data patterns with machine, operator, or shift variables.<br>2.4 Use statistical indicators like standard deviation and Cp/Cpk.<br>2.5 Predict failure modes using regression or trend analysis.<br>2.6 Present findings in visual dashboards for decision-making.<br>2.7 Recommend pre-emptive actions based on analysed data. |

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|---|---|
| **3. Create control charts and reports to support data-driven decision-making.** | 3.1 Select appropriate control charts for given processes.<br>3.2 Design report formats including trend analysis and capability indices.<br>3.3 Summarise SPC outcomes in technical and summary reports.<br>3.4 Propose process adjustments based on control chart behaviour.<br>3.5 Validate process changes using updated SPC reports.<br>3.6 Archive reports for traceability and audit readiness.<br>3.7 Train operators on interpreting SPC charts for self-monitoring. |

### QC0013-08- Quality Planning and Auditing in Mechanical Engineering Projects

This unit introduces learners to quality planning before and during mechanical engineering projects. It teaches how to prepare quality plans, quality objectives, and checklists. Learners also study how to carry out internal audits to ensure that all processes and outputs meet required standards.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Design comprehensive quality plans for mechanical engineering operations.** | 1.1 Define quality objectives aligned with project specifications and client requirements.<br>1.2 Develop inspection and testing schedules for various project stages.<br>1.3 Allocate roles, responsibilities, and escalation procedures within the quality plan.<br>1.4 Integrate risk assessment findings into quality control strategies.<br>1.5 Create detailed process flow diagrams and quality checkpoints.<br>1.6 Incorporate supplier and subcontractor quality requirements into the plan.<br>1.7 Document version-controlled plans and ensure accessibility to stakeholders. |
| **2. Conduct internal and supplier audits in accordance with quality management systems.** | 2.1 Prepare detailed audit checklists aligned with ISO and internal standards.<br>2.2 Gather and verify evidence from documents, records, and process observations.<br>2.3 Identify audit findings, non-conformities, and areas of concern.<br>2.4 Communicate audit observations professionally to relevant personnel.<br>2.5 Assess supplier compliance with contractual and quality obligations.<br>2.6 Record audit outcomes in structured audit reports.<br>2.7 Recommend corrective actions and track their implementation status.<br>2.8 Maintain an annual audit schedule with follow-up procedures. |

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|---|---|
| **3. Report findings and recommend improvements for continual process enhancement.** | 3.1 Compile audit summaries and analysis into formal presentations or written reports.<br>3.2 Prioritise improvement areas based on impact and urgency.<br>3.3 Align recommendations with industry best practices and lean principles.<br>3.4 Collaborate with engineering and operations staff to implement improvements.<br>3.5 Conduct cost-benefit analysis for proposed changes.<br>3.6 Evaluate post-audit performance metrics to measure improvement.<br>3.7 Record lessons learned to improve future audits and planning processes. |

### QC0013-09- Integration of Quality Control with Lean Manufacturing and Six Sigma

Learners will discover how quality control works together with modern production systems like Lean and Six Sigma. This unit shows how waste can be reduced and how efficiency and product quality can be improved by applying tools like 5S, Kaizen, DMAIC, and process mapping within a quality control framework.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| **1. Combine quality control methods with Lean and Six Sigma approaches.** | 1.1 Map processes to identify waste and quality gaps using VSM (Value Stream Mapping).<br>1.2 Apply DMAIC framework to resolve quality-related inefficiencies.<br>1.3 Integrate visual management and standardised work practices into quality control.<br>1.4 Justify use of Lean or Six Sigma tools based on operational context.<br>1.5 Perform root cause analysis within a Lean/Six Sigma environment.<br>1.6 Identify and eliminate non-value-added activities impacting quality.<br>1.7 Monitor the effect of integrated approaches on defect rates and cycle time. |
| **2. Improve process efficiency while maintaining product integrity and compliance.** | 2.1 Analyse process data to determine areas of inefficiency.<br>2.2 Recommend changes that streamline operations without compromising quality standards.<br>2.3 Validate improved processes through capability analysis.<br>2.4 Maintain full traceability of parts and processes during optimisation.<br>2.5 Ensure compliance with ISO or client-specific quality standards post-implementation.<br>2.6 Balance cost, time, and quality considerations when proposing changes.<br>2.7 Monitor process metrics to ensure stability after optimisation.<br>2.8 Engage cross-functional teams in continuous improvement initiatives. |

3. **Drive performance improvements through structured quality initiatives.**

3.1 Lead Kaizen events or team-based improvement sessions.
3.2 Define and track KPIs related to quality, efficiency, and customer satisfaction.
3.3 Align performance improvement goals with strategic business objectives.
3.4 Develop action plans with defined milestones and monitoring criteria.
3.5 Analyse before-and-after data to assess performance improvement success.
3.6 Standardise improved processes to prevent regression.
3.7 Communicate improvement outcomes to stakeholders and staff.

## QC0013-10- Leadership and Supervisory Skills in Mechanical Quality Management

This unit helps learners develop the skills needed to lead a quality team or manage quality tasks on the production floor. Topics include communication, team coordination, and decision-making, handling conflicts, and motivating staff. Learners will understand how leadership impacts quality performance and continuous improvement in the workplace.

| Learning Outcome: | Assessment Criteria: |
|---|---|
| 1. **Apply leadership principles to manage mechanical quality teams effectively.** | 1.1 Demonstrate effective delegation and task distribution in quality-related functions.<br>1.2 Motivate team members using appropriate leadership styles.<br>1.3 Resolve interpersonal conflicts and quality-related disagreements constructively.<br>1.4 Support staff development through training and mentorship.<br>1.5 Make decisions based on data, ethics, and policy guidelines.<br>1.6 Provide regular performance feedback tied to quality goals.<br>1.7 Adapt leadership approach based on situational needs and team dynamics.<br>1.8 Evaluate team performance using structured appraisal tools. |
| 2. **Oversee inspection and testing operations with professional authority.** | 2.1 Develop daily inspection schedules based on production priorities.<br>2.2 Monitor inspection teams for adherence to standard procedures.<br>2.3 Verify inspection data for accuracy, completeness, and traceability.<br>2.4 Intervene in cases of major non-conformance or process deviation.<br>2.5 Ensure all personnel are competent and certified for their tasks.<br>2.6 Maintain consistent quality output under shifting operational demands.<br>2.7 Approve final product release based on inspection outcomes. |

3. **Foster a culture of quality through team engagement and clear communication.**

3.1 Conduct regular quality meetings to share updates and gather input.
3.2 Communicate expectations clearly through visual aids, notices, and briefings.
3.3 Recognise and reward quality achievements within the team.
3.4 Promote reporting of quality concerns without fear of blame.
3.5 Share audit and inspection results transparently to support learning.
3.6 Encourage collaboration between departments on quality improvement.
3.7 Establish continuous feedback loops to engage staff in quality ownership..

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