

# ICTQual AB



## Qualification Specification

### ICTQual AB Level 5 Diploma in Quality Control Manufacturing



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# ICTQual AB's

## Level 5 Diploma in Quality Control Manufacturing

### Contents

ICTQual AB Level 5 Diploma in Quality Control Manufacturing..... 1

About ICTQual AB's..... 2

Course Overview..... 2

Certification Framework.....4

Entry Requirements.....4

Qualification Structure ..... 5

Centre Requirements ..... 2

Support for Candidates .....7

Assessment .....7

Unit Descriptors .....8 to 27

## **Qualification Specification about**

# **ICTQual AB Level 5 Diploma in Quality Control Manufacturing**

### **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 ICTQual AB Level 5 Diploma in Quality Control – Manufacturing is a comprehensive and advanced qualification designed to meet the growing demands of quality excellence in modern manufacturing environments. This diploma develops the technical, analytical, and leadership capabilities required to implement and manage robust quality control systems in line with international best practices and regulatory expectations. Learners will explore the full scope of quality assurance principles, compliance requirements, inspection methods, statistical process control, risk-based thinking, and performance improvement strategies critical to manufacturing operations. This qualification ensures learners are equipped to align manufacturing output with established standards and objectives, drive operational consistency, enhance product reliability, and reduce variability in production outcomes. Emphasis is placed on proactive quality methodologies, internal evaluation techniques, documentation and reporting standards, and the practical application of inspection and test protocols across different stages of production. The programme fosters a deep understanding of continuous improvement mechanisms essential to achieving organisational effectiveness and stakeholder satisfaction.

Through this structured approach, the diploma supports the development of professionals who are capable of integrating quality planning into operational functions, interpreting regulatory and industrial standards, and leading quality improvement initiatives within diverse manufacturing settings.

### Course Aim

The primary aim of this diploma is to develop competent quality control professionals who can:

- Apply quality control principles and techniques to ensure conformance with manufacturing standards.
- Interpret and implement quality control systems aligned with operational goals and industry benchmarks.
- Analyse and respond to quality-related data to identify areas for improvement.
- Manage inspection activities, testing procedures, and documentation in line with compliance and traceability requirements.
- Lead continuous improvement initiatives to enhance production quality, safety, and efficiency.
- Evaluate supplier quality, internal processes, and customer feedback to drive performance enhancement.

### Who Can Apply for This Course

This diploma is suitable for:

- Quality assurance or quality control personnel seeking advancement into supervisory or managerial roles.
- Manufacturing technicians or engineers aspiring to specialise in quality systems management.
- Professionals from production, maintenance, or supply chain functions aiming to expand their knowledge of quality practices.
- Individuals holding a Level 4 qualification or equivalent experience in a technical or manufacturing discipline.
- Employees wishing to formalise their skills in quality control to meet evolving industry standards and expectations.

The course is particularly relevant for those committed to promoting quality excellence and ensuring product compliance across manufacturing processes.

Certification Framework

Qualification title	ICTQual AB Level 5 Diploma in Quality Control Manufacturing
Course ID	QC0022
Grading Type	Pass / Fail
Competency Evaluation	Coursework / Assignments / Verifiable Experience
Assessment	<p>The assessment and verification process for ICTQual AB’s qualifications involves two key stages:</p> <p><b>Internal Assessment and Verification:</b></p> <ul style="list-style-type: none"><li>✓ Conducted by the staff at the Approved Training Centre (ATC) to ensure learners meet the required standards through continuous assessments.</li><li>✓ Internal Quality Assurance (IQA) is carried out by the centre’s IQA staff to validate the assessment process.</li></ul> <p><b>External Quality Assurance:</b></p> <ul style="list-style-type: none"><li>✓ Managed by ICTQual AB’s verifiers, who periodically review the centre’s assessment and IQA processes.</li></ul> <p>Verifies that assessments are conducted to the required standards and ensures consistency across centres</p>

Entry Requirements

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

- **Minimum Age:**

Learners must be at least 18 years of age at the time of enrolment.

- **Educational Background:**

A Level 4 qualification in a related field such as manufacturing, engineering, or industrial technology is required. Learners should have a strong understanding of technical processes, quality systems, and basic statistical principles.

- **Industry Experience:**

It is recommended that learners have at least one year of relevant work experience in a manufacturing or quality control setting. Practical exposure to production processes and inspection methods will enhance the learning experience and application of course content.

These entry requirements are designed to ensure that learners have the foundational knowledge and practical awareness necessary to succeed in advanced quality control roles within the manufacturing industry.

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
QC0022-01	Strategic Quality Management in Manufacturing Operations
QC0022-02	Advanced Measurement Systems and Calibration Techniques
QC0022-03	International Quality Standards and Regulatory Compliance (ISO, ASTM, etc.)
QC0022-04	Statistical Quality Control and Process Capability Analysis
QC0022-05	Supplier Quality Assurance and Auditing Practices
QC0022-06	Product Lifecycle Quality Planning and Risk Management
QC0022-07	Root Cause Analysis and Continuous Improvement Methodologies
QC0022-08	Quality Control in Automation and Modern Production Systems
QC0022-09	Leadership and Team Supervision in Quality Environments
QC0022-10	Technical Documentation, Reporting, and Quality Metrics Evaluation

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 a qualification at Level 6 or above in quality control, engineering, manufacturing, or a related field.
- ✓ **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

QC0022-01- Strategic Quality Management in Manufacturing Operations

This unit focuses on the principles of planning and managing quality across manufacturing operations. Learners will explore how to create and align quality objectives with operational goals, design quality policies, and evaluate system performance. The unit covers strategic decision-making, integration of quality into business functions, and the development of quality frameworks that support long-term performance and competitiveness. Learners will also study cost of quality, benchmarking, and aligning quality strategies with customer and stakeholder expectations.

Learning Outcome:	Assessment Criteria:
1. Understand the principles of strategic quality planning within manufacturing.	<div>1.1 Analyse the relationship between strategic quality planning and competitive advantage.</div> <div>1.2 Critically evaluate models such as Hoshin Kanri and their application in manufacturing contexts.</div> <div>1.3 Explain the influence of external market and regulatory factors on quality planning.</div> <div>1.4 Assess the alignment between corporate vision, mission, and quality objectives.</div> <div>1.5 Evaluate the role of stakeholder consultation in shaping quality planning decisions.</div> <div>1.6 Compare the effectiveness of short-term versus long-term strategic quality initiatives.</div>
2. Develop and implement quality strategies aligned with organisational goals.	<div>2.1 Design strategic quality plans using SWOT and PESTEL analysis outcomes.</div> <div>2.2 Formulate SMART quality objectives consistent with business performance metrics.</div> <div>2.3 Develop implementation frameworks including timelines, KPIs, and resource allocations.</div> <div>2.4 Apply risk management principles during strategy implementation.</div> <div>2.5 Integrate customer feedback and market trends into strategy formulation.</div> <div>2.6 Lead cross-functional collaboration to embed quality strategy across departments.</div> <div>2.7 Monitor and adjust strategies using feedback loops and performance reviews.</div>
3. Evaluate the impact of quality management systems on operational performance.	<div>3.1 Analyse pre- and post-QMS implementation data on productivity, rework, and efficiency.</div> <div>3.2 Interpret internal audit results to assess systemic effectiveness of the QMS.</div> <div>3.3 Compare operational KPIs such as defect rate, lead time, and throughput post-QMS.</div>

- 3.4 Assess employee involvement and behavioural changes due to QMS integration.
- 3.5 Recommend continuous improvement initiatives based on QMS performance gaps.

QC0022-02- Advanced Measurement Systems and Calibration Techniques

This unit introduces learners to high-level measurement systems used in manufacturing for precision and accuracy. It explains the importance of reliable measuring equipment, calibration procedures, and traceability. Topics include metrology principles, calibration methods, measurement uncertainty, and managing equipment standards. Learners will also learn how to interpret calibration certificates, conduct measurement system analysis (MSA), and ensure conformance to tolerances in production processes.

Learning Outcome:	Assessment Criteria:
1. Apply advanced measurement methods to assess product accuracy and compliance.	<div>1.1 Select and justify use of advanced tools (e.g., CMM, laser scanners) for specific tolerances.</div> <div>1.2 Conduct dimensional, functional, and surface quality measurements using precision instruments.</div> <div>1.3 Interpret complex measurement datasets against engineering standards.</div> <div>1.4 Document measurement findings using GD&amp;T symbols and industry formats.</div> <div>1.5 Evaluate the influence of environmental conditions on measurement outcomes.</div> <div>1.6 Compare measurement methods for accuracy, repeatability, and operator reliability.</div>
2. Understand calibration procedures for precision instruments and equipment.	<div>2.1 Define calibration standards, traceability hierarchy, and national/international references.</div> <div>2.2 Execute calibration procedures and verify uncertainty calculations.</div> <div>2.3 Develop calibration schedules based on risk and usage frequency.</div> <div>2.4 Assess the impact of non-calibrated equipment on product conformity.</div> <div>2.5 Maintain detailed calibration logs and evaluate their role in quality assurance.</div>
3. Ensure traceability and consistency in measurement systems.	<div>3.1 Establish full traceability chains from instrument readings to primary standards.</div> <div>3.2 Implement control plans ensuring repeatable and reproducible measurement processes.</div> <div>3.3 Conduct Gage R&amp;R studies to assess measurement system variability.</div> <div>3.4 Evaluate influence of operator, instrument, and environment on measurement deviation.</div>

- 3.5 Apply statistical methods to validate system capability.
- 3.6 Implement process controls for labelling, status identification, and segregation of measuring devices.
- 3.7 Audit metrology systems for consistency with ISO/IEC 17025 requirements.

QC0022-03- International Quality Standards and Regulatory Compliance (ISO, ASTM, etc.)

This unit helps learners understand the key international standards that guide quality in manufacturing, such as ISO 9001, ASTM, and sector-specific requirements. It covers the purpose and structure of these standards, how to interpret their clauses, and how to implement them within a company. Learners will also explore regulatory compliance, legal obligations, customer requirements, and the role of third-party audits and certification bodies.

Learning Outcome:	Assessment Criteria:
1. Interpret and apply international standards relevant to manufacturing quality control.	<div>1.1 Differentiate between ISO 9001, ISO 13485, ASTM, and sector-specific frameworks.</div> <div>1.2 Conduct clause-by-clause analyses for key ISO standards.</div> <div>1.3 Translate standard requirements into organisational SOPs and WI formats.</div> <div>1.4 Perform gap analysis for current practices vs. standard requirements.</div> <div>1.5 Justify applicability of specific clauses within a given manufacturing context.</div>
2. Ensure processes meet regulatory and customer-specific compliance requirements.	<div>2.1 Identify overlapping and conflicting compliance requirements across jurisdictions.</div> <div>2.2 Design process maps incorporating legal, regulatory, and contractual obligations.</div> <div>2.3 Conduct internal audits and inspections focused on regulatory compliance.</div> <div>2.4 Develop documentation to support third-party or notified body audits.</div> <div>2.5 Track and manage changes in customer-specific requirements proactively.</div> <div>2.6 Establish escalation protocols for compliance violations and their containment.</div>
3. Integrate global standards into organisational quality systems.	<div>3.1 Develop integrated management systems (IMS) combining ISO 9001, ISO 14001, and ISO 45001.</div> <div>3.2 Harmonise standard procedures across multiple sites or international operations.</div> <div>3.3 Train staff across departments on new or revised global standard implementations.</div> <div>3.4 Align supplier requirements with international compliance frameworks.</div>

- 3.5 Update quality manuals and policy statements to reflect integrated standards.
- 3.6 Use benchmarking to identify gaps between current systems and global best practices.
- 3.7 Perform cost-benefit analysis of implementing new international standard requirements.

QC0022-04- Statistical Quality Control and Process Capability Analysis

In this unit, learners will study the use of statistics in monitoring and controlling manufacturing processes. Topics include control charts, process variation, data collection, and analysis techniques. Learners will apply tools such as process capability indices (Cp, Cpk), histograms, and cause-effect diagrams to evaluate production performance and detect trends. The unit promotes data-driven decisions for maintaining and improving product quality.

Learning Outcome:	Assessment Criteria:
1. Utilise statistical tools to monitor process performance and variation.	<div>1.1 Select appropriate control charts based on data type (<math>\bar{X}</math>-R, p, np, u, etc.).</div> <div>1.2 Collect and validate real-time process data for statistical analysis.</div> <div>1.3 Interpret control charts to distinguish between special and common cause variations.</div> <div>1.4 Apply statistical rules to detect trends, shifts, and patterns in processes.</div> <div>1.5 Use software tools (e.g., Minitab, JMP) to automate and visualise control data.</div> <div>1.6 Recommend corrective actions based on statistical deviation patterns.</div>
2. Conduct process capability studies and interpret control charts.	<div>2.1 Calculate Cp, Cpk, Pp, and Ppk values for both short- and long-term studies.</div> <div>2.2 Evaluate process stability before determining capability indices.</div> <div>2.3 Interpret capability results in the context of customer tolerance limits.</div> <div>2.4 Develop control limits and specification limits for new or modified processes.</div> <div>2.5 Assess process readiness for validation using statistical indicators.</div> <div>2.6 Compare multi-batch or multi-line performance across shifts or facilities.</div> <div>2.7 Create reports summarising process behaviour, distribution shape, and capability.</div>



**3. Apply data-driven insights to maintain and improve quality.**

- 3.1 Identify root causes using Pareto analysis, histograms, and scatter plots.
- 3.2 Correlate process data with customer complaints and warranty issues.
- 3.3 Predict process failure points using trend analysis and regression techniques.
- 3.4 Prioritise improvement opportunities using statistical decision-making tools.
- 3.5 Present findings and recommendations to management using statistical evidence.

**QC0022-05- Supplier Quality Assurance and Auditing Practices**

This unit focuses on managing and improving supplier performance in manufacturing. Learners will explore how to assess supplier capabilities, set quality expectations, and carry out supplier audits. Topics include supplier selection, performance monitoring, compliance audits, and corrective action management. The unit encourages learners to develop skills in communication, negotiation, and collaboration with external partners to ensure consistent supply chain quality.

Learning Outcome:	Assessment Criteria:
1. Assess supplier performance against quality and compliance benchmarks.	<ul style="list-style-type: none"><li>1.1 Develop supplier scorecards including metrics like OTD, PPM, NCRs.</li><li>1.2 Perform comparative benchmarking of suppliers across geographical regions.</li><li>1.3 Analyse long-term trends in supplier defect data and escalation cases.</li><li>1.4 Evaluate supplier process maturity using models like CMMI or APQP.</li><li>1.5 Conduct periodic risk-based assessments of supplier performance.</li></ul>
2. Plan and conduct supplier audits to ensure conformity with standards.	<ul style="list-style-type: none"><li>2.1 Design audit plans incorporating scope, objectives, and audit criteria.</li><li>2.2 Use structured checklists aligned with ISO 9001 or IATF 16949.</li><li>2.3 Interview supplier personnel to verify process knowledge and system controls.</li><li>2.4 Identify process inefficiencies or compliance gaps during onsite visits.</li><li>2.5 Document findings using objective evidence and grade nonconformities.</li><li>2.6 Evaluate effectiveness of supplier's internal corrective action systems.</li><li>2.7 Submit final audit reports with risk classification and follow-up timelines.</li></ul>
3. Develop action plans to address supplier-related quality issues.	<ul style="list-style-type: none"><li>3.1 Collaborate with suppliers to initiate containment actions and root cause analysis.</li><li>3.2 Define timelines and responsibilities for corrective and preventive actions.</li><li>3.3 Monitor the implementation and effectiveness of CAPAs.</li><li>3.4 Escalate recurring or critical issues via supplier escalation procedures.</li></ul>

- 3.5 Update approved supplier lists based on action plan results and risk evaluations.
- 3.6 Support suppliers with training or process improvement workshops.

QC0022-06- Product Lifecycle Quality Planning and Risk Management

This unit covers quality planning throughout the lifecycle of a product—from design to end-of-life. Learners will study tools like APQP (Advanced Product Quality Planning), FMEA (Failure Mode and Effects Analysis), and control plans. The unit teaches how to anticipate, assess, and manage risks in quality performance at different stages of production and use. Learners will also examine customer feedback and its role in lifecycle quality improvements.

Learning Outcome:	Assessment Criteria:
1. Implement quality planning throughout the product development lifecycle.	<div>1.1 Integrate quality checkpoints at each stage of the product lifecycle (design, pilot, launch).</div> <div>1.2 Develop and implement APQP (Advanced Product Quality Planning) frameworks.</div> <div>1.3 Align design validation and verification activities with quality objectives.</div> <div>1.4 Coordinate FMEA reviews across departments for proactive planning.</div> <div>1.5 Create control plans aligned with product-specific risk factors.</div> <div>1.6 Document lessons learned to refine future lifecycle quality processes.</div>
2. Identify and mitigate quality risks using structured risk management tools.	<div>2.1 Use PFMEA and DFMEA to identify severity, occurrence, and detection risks.</div> <div>2.2 Prioritise quality risks using RPN scoring and threshold criteria.</div> <div>2.3 Develop mitigation strategies tailored to high-impact risk areas.</div> <div>2.4 Recalculate RPN post-mitigation to validate effectiveness.</div> <div>2.5 Integrate risk registers with quality system documentation.</div>
3. Support cross-functional collaboration in product and process design.	<div>3.1 Facilitate design reviews involving engineering, manufacturing, and quality teams.</div> <div>3.2 Align design outputs with process capabilities and customer expectations.</div> <div>3.3 Coordinate simultaneous engineering to address manufacturability early.</div> <div>3.4 Track cross-functional inputs using structured meeting records.</div>

- 3.5 Apply QFD (Quality Function Deployment) to translate customer needs into design specs.
- 3.6 Resolve cross-departmental conflicts through quality impact assessment.
- 3.7 Evaluate design iteration effectiveness based on feedback loops.

QC0022-07- Root Cause Analysis and Continuous Improvement Methodologies

Learners will explore problem-solving methods to identify and eliminate the root causes of quality issues. This unit includes techniques such as 5 Whys, Fishbone diagrams, Pareto analysis, and DMAIC (Define, Measure, Analyse, Improve, Control). It promotes a culture of continuous improvement (Kaizen) and teaches how to use data and team-based approaches to implement effective, long-lasting changes in manufacturing quality systems.

Learning Outcome:	Assessment Criteria:
1. Apply root cause analysis tools such as the 5 Whys and Fishbone Diagram	<div>1.1 Select appropriate RCA tools based on the nature and complexity of the problem.</div> <div>1.2 Develop detailed Fishbone Diagrams categorised by process, people, materials, and methods.</div> <div>1.3 Use the 5 Whys technique to drill down to the root cause with supporting evidence.</div> <div>1.4 Facilitate RCA workshops involving cross-functional teams.</div> <div>1.5 Document and verify each causal path with data or observational evidence.</div> <div>1.6 Validate the identified root cause by eliminating variables and confirming outcomes.</div>
2. Implement continuous improvement strategies like PDCA and Six Sigma	<div>2.1 Design and execute PDCA cycles targeting specific quality bottlenecks.</div> <div>2.2 Apply DMAIC methodology to improve defect-prone processes.</div> <div>2.3 Use Six Sigma tools (e.g., SIPOC, CTQ, Process Mapping) to define improvement scope.</div> <div>2.4 Analyse process data using sigma levels and capability indices.</div> <div>2.5 Implement changes using Lean tools such as Kaizen, 5S, and Poka-Yoke.</div> <div>2.6 Measure effectiveness of improvements post-implementation using control charts.</div> <div>2.7 Integrate CI practices into daily operations and long-term strategic goals.</div>
3. Drive long-term improvements in product quality and process efficiency.	<div>3.1 Establish baseline performance indicators and set improvement targets.</div> <div>3.2 Monitor sustained performance using KPIs and trend analysis.</div> <div>3.3 Institutionalise best practices through SOP revisions and training.</div>

- 3.4 Quantify cost savings and waste reduction from improvement initiatives.
- 3.5 Promote CI culture through recognition, engagement, and team-based incentives.



QC0022-08- Quality Control in Automation and Modern Production Systems

This unit introduces quality control within automated and smart manufacturing environments. Learners will study the impact of robotics, PLCs, sensors, and Industry 4.0 technologies on quality processes. Topics include real-time monitoring, automated inspections, and digital quality records. The unit highlights how automation can improve consistency, traceability, and data accuracy in quality assurance tasks.

Learning Outcome:	Assessment Criteria:
1. Understand the role of automation in enhancing quality control.	<div>1.1 Explain the benefits and limitations of automation in defect detection.</div> <div>1.2 Evaluate various automated inspection methods (e.g., machine vision, AI-based sensors).</div> <div>1.3 Compare manual and automated quality control processes in terms of efficiency and accuracy.</div> <div>1.4 Interpret how Industry 4.0 technologies contribute to real-time quality assurance.</div> <div>1.5 Assess integration challenges between quality systems and automated platforms.</div>
2. Monitor automated processes and equipment for consistent output.	<div>2.1 Use SPC software to collect and analyse data from automated systems.</div> <div>2.2 Develop automated alert systems for process deviations or anomalies.</div> <div>2.3 Calibrate and verify sensors and control systems periodically.</div> <div>2.4 Review logs and machine outputs to detect recurring faults.</div> <div>2.5 Implement predictive maintenance schedules based on quality feedback.</div> <div>2.6 Evaluate false positive/negative rates in automated inspection systems.</div> <div>2.7 Report deviations and initiate immediate containment actions.</div>
3. Integrate quality systems into digital manufacturing environments.	<div>3.1 Map out MES and ERP integration for real-time quality tracking.</div> <div>3.2 Implement digital dashboards for visualising KPIs and alerts.</div> <div>3.3 Use IoT-enabled devices to capture live quality metrics from equipment.</div>

- 3.4 Maintain data integrity through traceable digital records.
- 3.5 Ensure cybersecurity compliance in connected quality control systems.
- 3.6 Train operators on interfacing with digital quality monitoring tools.

**QC0022-09 Leadership and Team Supervision in Quality Environments**

This unit helps learners develop leadership and supervisory skills for managing quality teams. Topics include communication, motivation, conflict resolution, and performance management. Learners will explore leadership styles, training needs analysis, and the role of team leaders in promoting quality culture and accountability. The unit also focuses on workplace ethics, safety, and continuous professional development in quality-focused environments.

Learning Outcome:	Assessment Criteria:
1. Develop leadership skills for managing quality teams and workflows.	<div>1.1 Assess different leadership styles suitable for quality-driven teams.</div> <div>1.2 Delegate responsibilities effectively based on team members' skills and competencies.</div> <div>1.3 Manage change initiatives that improve quality culture and systems.</div> <div>1.4 Set clear team goals aligned with organisational quality objectives.</div> <div>1.5 Conduct performance reviews and provide constructive feedback.</div> <div>1.6 Mentor junior staff and build succession planning pathways.</div>
2. Communicate quality goals and support team development.	<div>2.1 Create and deliver presentations to communicate strategic quality goals.</div> <div>2.2 Use visual tools (dashboards, graphs) to simplify data for team understanding.</div> <div>2.3 Develop training plans based on skill gaps and quality requirements.</div> <div>2.4 Promote inter-departmental communication for consistent quality standards.</div> <div>2.5 Gather feedback from staff to refine communication approaches.</div>
3. Foster a culture of quality and accountability within manufacturing operations.	<div>3.1 Develop recognition systems that reward quality excellence.</div> <div>3.2 Lead initiatives that link individual accountability with product performance.</div> <div>3.3 Promote ownership of processes through cross-functional quality circles.</div> <div>3.4 Audit behavioural indicators of quality culture such as compliance, initiative, and reporting.</div>

- 3.5 Encourage transparent reporting of near-misses and process deviations.
- 3.6 Create mechanisms for continuous feedback and team-led improvements.
- 3.7 Measure culture change using internal surveys and performance outcomes.

QC0022-10- Technical Documentation, Reporting, and Quality Metrics Evaluation

This unit teaches learners how to prepare, manage, and evaluate technical documents used in quality control. Topics include writing inspection reports, maintaining records, analysing quality metrics (KPIs), and presenting findings to stakeholders. Learners will understand how documentation supports compliance, decision-making, and continual improvement. Emphasis is placed on clarity, accuracy, and traceability in quality documentation.

Learning Outcome:	Assessment Criteria:
1. Prepare and manage detailed quality documentation and technical reports.	<div>1.1 Draft comprehensive reports including process performance, audit findings, and NCRs.</div> <div>1.2 Use standardised templates for SOPs, work instructions, and control plans.</div> <div>1.3 Validate report accuracy by cross-checking data sources and references.</div> <div>1.4 Ensure version control and access security in document management systems.</div> <div>1.5 Align documentation with external audit and regulatory requirements.</div>
2. Analyse quality data to track performance indicators and trends.	<div>2.1 Collect and normalise data across batches, shifts, and production lines.</div> <div>2.2 Use run charts, Pareto diagrams, and heat maps to visualise trends.</div> <div>2.3 Compare internal performance data against industry benchmarks.</div> <div>2.4 Segment and analyse quality metrics by defect type, location, and root cause.</div> <div>2.5 Provide statistical commentary and insights to senior management.</div> <div>2.6 Recommend actions based on data anomalies or emerging risks.</div>
3. Use reporting tools to support audits, compliance, and decision-making.	<div>3.1 Create audit-ready dashboards with automated report generation.</div> <div>3.2 Customise reporting for internal, customer, and regulatory audits.</div> <div>3.3 Implement BI tools (e.g., Power BI, Tableau) for dynamic reporting.</div> <div>3.4 Use reports to justify CAPA decisions and investment proposals.</div>

- 3.5 Ensure traceability of report data to source systems.
- 3.6 Present findings to stakeholders with clear risk prioritisation.
- 3.7 Use audit reports as a foundation for improvement planning.

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