Higher National Unit Specification

General information for centres

Unit title: Quality Management: An Introduction

Unit code: DT8Y 34

Unit purpose: This Unit is designed to allow candidates to explain and distinguish between different Quality approaches. The Unit also provides candidates with opportunities to examine different quality control techniques and analyse quality costs. The Unit has been written with a view to providing candidates with an overview of Quality as applied in the context of the candidate's working environment.

On completion of the Unit candidates should be able to:

1   Explain the fundamental principles of Quality Assurance and Quality Control
2   Explain the stages to be met in the process of achieving ISO 9001.
3   Select and apply quality improvement tools and techniques
4   Categorise, analyse and interpret a quality costing model.

Credit points and level: 1 HN Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.

Recommended prior knowledge and skills: Access to this Unit is at the discretion of the centre. However, it would be beneficial if the candidate had experience of industrial organisations and/or quality assurance systems.

Core Skills: There may be opportunities to gather evidence towards the following listed Core Skills components in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Written Communication   Higher
Using Graphical Information   Higher
Using Information Technology   Higher
Critical Evaluation   Higher

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

General information for centres (cont)

Assessment: Outcomes 1 and 3 can be assessed by a single assessment paper taken at a single assessment event lasting 1 hour. The assessment should be conducted under controlled, supervised conditions. The assessment should be based on an explanation of Quality Control and Quality Assurance principles and the application of Total Quality Management principles in the workplace.

Outcome 2 may be assessed by an assignment of between 800 and 1,000 words based on a Case Study of a new company setting up quality systems and applying for and achieving ISO 9001. The assignment report must include timelines showing how the company progressed through the journey towards implementing a quality system and being accredited with ISO 9001.

Outcome 4 may be assessed by a Case Study lasting 1 hour, conducted under controlled, supervised conditions. Candidate evidence should take the form of graphs and charts and the production of a written report of 250 words evaluating the cost trends shown in the graphs/charts.

Higher National Unit specification: statement of standards

Unit title: Quality Management: An Introduction

Unit code: DT8Y 34

The sections of the Unit stating the Outcomes, knowledge and/or skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Explain the fundamental principles of Quality Assurance and Quality Control

Knowledge and/or skills

♦   Definition of Quality
♦   Quality Control
♦   Quality Assurance
♦   TQM activities
♦   Principles of quality assurance and total quality in the workplace
♦   Inspection procedures and techniques

Evidence Requirements

Evidence for the knowledge and/or skills items in this Outcome will be provided on a sample basis. The evidence may be provided in response to specific questions. Each candidate must demonstrate that she/he can answer questions based on a sample of the items shown above. In any assessment of the Outcome **four out of six** knowledge and/or skills items should be sampled.

In order to ensure that candidates will not be able to foresee which items they will be questioned on, a different sample of four out of six knowledge and/or skills items is required each time the Outcome is assessed. Candidates must provide a satisfactory response to all four items.

Where sampling takes place, a candidate's response can be judged to be satisfactory where evidence provided is sufficient to meet the requirements for each item by showing that the candidate is able to:

♦   explain what is meant by the term Quality
♦   explain what is meant by the term Quality Control
♦   explain what is meant by the term Quality Assurance
♦   explain what is meant by Total Quality Management
♦   compare TQM activities related to the workplace

Unit title: Quality Management: An Introduction

♦ describe two inspection procedures/techniques from the following:
— receiving
— first-off
— patrol
— final

Assessment must be conducted under controlled, supervised conditions. It should also be conducted under closed-book conditions and as such, candidates should not be allowed to bring any textbooks, handouts or notes to the assessment.

Assessment guidelines

This Outcome may be assessed by a written paper lasting 30 minutes or may be combined with the assessment of Outcome 3 to form one assessment paper (lasting one hour), details of which are provided in the Evidence Requirement section of Outcome 3.

The assessment paper should take the form of a balance of short answer, restricted response and structured questions.

Short answer questions should be used to cover the explanation of Quality, Quality Control and Quality Assurance.

Restricted response questions should be used to compare TQM activities related to the workplace and should cover topic areas such as organisational culture, management responsibility, ownership of processes, customer requirements and internal and external customer relationships.

Inspection procedures and techniques should be assessed using simulated data applicable to the specialism of the candidate group and should demonstrate a minimum of two techniques.

Outcome 2

Explain the stages to be met in the process of achieving ISO 9001

Knowledge and/or skills

♦ Objectives and major clauses of ISO 9001
♦ Procedures involved in gaining and maintaining certification in terms of the criteria specified by the United Kingdom Accreditation Service (or any subsequent replacement body)

Evidence Requirements

All knowledge and/or skills items in this Outcome must be assessed.

Candidate evidence must be presented in the form of an assignment report of between 800 and 1,000 words based on a Case Study of a new company setting up a quality system and applying for and achieving ISO 9001. The assignment report must make appropriate reference to the relevant ISO 9001 standards. In addition, the report must make clear references to the following:

Higher National Unit specification: statement of standards (cont)

Unit title: Quality Management: An Introduction

♦ management buy-in and commitment
♦ quality policy
♦ communication strategy
♦ appropriate documentation
♦ training of staff
♦ internal audit procedures
♦ certification requirements

The report must also include clear timelines showing how the company progressed through the journey towards implementing a quality system and being accredited with ISO 9001.

Candidates should prepare their assignment report in their own time. Centres should make every reasonable effort to ensure the assignment report is the candidate's own work. Where copying or plagiarism is suspected candidates may be interviewed to check their knowledge and understanding of the subject matter. A checklist should be used to record oral evidence of the candidate's knowledge and understanding.

Assessment guidelines

Centres may find it advantageous to issue candidates with guidance on how to structure their assignment report.

Outcome 3

Select and apply quality improvement tools and techniques

Knowledge and/or skills

♦ Selection criteria for quality improvement tools and techniques
♦ Application of quality improvement tools and techniques

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can select and apply a minimum of four quality improvement tools and techniques for practical applications from the following:

♦ Pareto analysis
♦ cause and effect diagrams
♦ histograms
♦ bar charts
♦ scatter diagrams
♦ data collection methods
♦ brainstorming
♦ SPC (variables or attributes)
♦ capability charts

Higher National Unit specification: statement of standards (cont)

Unit title: Quality Management: An Introduction

Assessment must be conducted under controlled, supervised, closed-book conditions and as such candidates should not be allowed to bring any textbooks, handouts or notes to the assessment. Candidates should be permitted to use scientific calculators during the assessment.

Assessment guidelines

This Outcome should be assessed by a series of practical exercises under closed-book conditions.

OR

An assessment paper lasting 30 minutes that takes the form of a balance of short answer, restricted response and structured questions.

OR

The assessment of this Outcome could be combined with that of Outcome 1. Assessment could consist of a single assessment paper taken at a single assessment event lasting 1 hour. The assessment must be based on an explanation of Quality Control and Quality Assurance principles and the application of Total Quality Management principles in the workplace.

In assessing quality improvement techniques the candidate should be required to interpret information, both written and graphical and make decisions about the relevant process.

Outcome 4

Categorise, analyse and interpret a quality costing model

Knowledge and/or skills

♦   Quality costs
♦   Interpretation and evaluation of cost data
♦   Graphical representation of cost data

Evidence Requirements

All knowledge and/or skills items in this Outcome should be assessed.

A candidate's response can be judged to be satisfactory where there is sufficient and accurate evidence to cover the following areas:

♦   identification of cost data
♦   collection and categorisation of data including:
  — prevention costs
  — appraisal costs
  — failure costs (internal and external)

Higher National Unit specification: statement of standards (cont)

Unit title: Quality Management: An Introduction

This Outcome must be assessed by a Case Study lasting 1 hour. Candidate evidence should take the form of graphs and charts and the production of a written report of approximately 250 words evaluating the cost trends shown in the graphs/charts. Assessment should be conducted under closed-book conditions and as such candidates should not be allowed to bring any textbooks, handouts or notes to the assessment.

Assessment guidelines

Centres may choose to do this assessment using appropriate software or the assessment can be completed manually.

Administrative Information

Unit code: DT8Y 34

Unit title: Quality Management: An Introduction

Superclass category: VD

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History of Changes:

Version	Description of change	Date
02	References to ISO 9000 changed to ISO 9001.	20/9/06

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Higher National Unit specification: support notes

Unit title: Quality Management: An Introduction

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit has been written in order to allow candidates to develop knowledge and understanding in the following areas:

1   The fundamental principles of Quality Assurance and Quality Control.
2   The application of quality systems including BS EN ISO 9001.
3   The analysis and selection of appropriate control methods for a given process.
4   The categorisation, analysis and interpretation of quality costs.

In designing this Unit, the Unit writer has identified the range of topics that would be expected to be covered by lecturers. The writer has also given recommendations as to how much time should be spent on each Outcome. This has been done to help lecturers to decide what depth of treatment should be given to the topics attached to each of the Outcomes. Whilst it is not mandatory for centres to use this list of topics, it is recommended that they do so as the assessment exemplar pack for this Unit is based on the knowledge and understanding of the topics in each of the Outcomes.

A list of topics for each Outcome is given below. Lecturers are advised to study this list in conjunction with the assessment exemplar pack so that they can get a clear indication of the standard of achievement expected of candidates in this Unit.

1   Explain the fundamental principles of Quality Assurance and Quality Control (8 hours)

The following topics are general in nature but should be put into context dependent upon the specialism of the group being taught.

- ♦   The different definitions of Quality:
    — British Standard
    — BS EN ISO 9001
    — Crosby
    — Deming

- ♦   Quality Control:
    — sorting good from bad
    — moving responsibility away from production to inspection
    — problems discovered after production rather than preventative measures

- ♦   Quality Assurance:
    — everyone responsible for their own work
    — change the process not the product

Unit title: Quality Management: An Introduction

♦   TQM activities:
   — different principles of Total Quality Management (Deming, Crosby, Juran etc)
   — customer requirements
   — organisational culture
   — management responsibility
   — ownership of processes
   — communication
   — internal and external customer relationships

♦   Inspection procedures and techniques:
   — receiving
   — first-off
   — patrol
   — final

2   Explain the stages to be met in the process of achieving ISO 9001 (12 hours)

♦   The needs of industry to meet the requirements of ISO 9001:
   — why companies need certification
   — why ISO 9001

♦   Understand the clauses of BS EN ISO 9001 (series 2000):
   — system requirements including quality auditing
   — management responsibility
   — resource management
   — product realisation
   — measurement, analysis and improvement
   — process for acquiring accreditation to BS EN ISO 9001

♦   Procedures involved in gaining and maintaining certification to ISO 9001:
   — quality policy
   — quality manual
   — use of consultants
   — development of the quality system

3   Select and apply quality improvement tools and techniques (14 hours)

♦   A range of quality improvement techniques are explained from:
   — data recording
   — histograms
   — charts (pie, scatter, line etc)
   — brainstorming
   — Pareto analysis
   — cause and effect diagrams - Ishikawa (fishbone diagrams)
   — Statistical Process Control (non mathematical treatment)

Higher National Unit specification: support notes (cont)

Unit title: Quality Management: An Introduction

4   Categorise, analyse and interpret a quality costing model (6 hours)

- ♦ Identification of quality costs is correct in terms of BS 6143:
   — identification of cost data
   — collection of categorisation of data including:
      – prevention costs
      – appraisal costs
      – failure costs (internal and external)

Where a set of costings is provided, the candidate should be encouraged to re-organise them into the following categories: prevention, appraisal or failure. The candidate should then show the information graphically and interpret the information in such a way as to make a decision about a relevant situation.

Guidance on the delivery and assessment of this Unit

It is intended that this Unit, as a whole, be taught as an appreciation of quality systems in an organisation, with the emphasis on the application of the quality system within that organisation.

As such lecturers may use a variety of learning and teaching methods including: lectures, group work, case studies and computer simulation. Visits to local companies to study their quality systems would be advantageous in enhancing candidates' knowledge and understanding of how quality operates in a practical environment. Likewise talks from guest speakers knowledgeable in aspects of quality control and assurance would also enhance candidate learning.

With regard to Process Control and Quality Costing, the emphasis should be on practical applications of models in a way best suited to the client group.

Delivery of Outcomes 1 and 2 should be aimed at an overview of generic quality principles, leading to the understanding of several Total Quality Management principles. An understanding of BS EN ISO 9001 should then be developed with an appreciation of the steps a company would be required to take to gain accreditation of this award.

Outcome 3 could be delivered by explaining several quality improvement techniques appropriate to the client group and applied to a variety of contexts. It is not anticipated that the list is exhaustive, or that all of the examples be investigated.

Outcome 4 should principally consist of exercises in the application and interpretation of quality costs. After understanding the concepts of quality costing as laid out in BS 6143 Part II, manipulation and completion of indicative charts should be undertaken using partially completed worksheets to introduce the application quality costs.

Details on the approaches to assessment are given under Evidence Requirements and Assessment Guidelines for each Outcome of the Higher National Unit specification: statement of standards section. It is recommended that this section is read carefully before proceeding with assessment of candidates.

Higher National Unit specification: support notes (cont)

Unit title: Quality Management: An Introduction

Opportunities for developing Core Skills

There may be opportunities to gather evidence towards the following listed Core Skills components in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Written Communication	at SCQF level 6
Using Graphical Information	at SCQF level 6
Using Information Technology	at SCQF level 6
Critical Evaluation	at SCQF level 6

Open learning

This Unit could be delivered by distance learning, which may incorporate some degree of tutor support. However, with regard to assessment, planning would be required by the centre concerned to ensure the sufficiency and authenticity of candidate evidence. Arrangements would have to be put in place to ensure the assessment for Outcomes 1, 3 and 4 were conducted under controlled, supervised conditions.

For information on normal open learning arrangements, please refer to the SQA guide *Assessment and Quality Assurance of Open and Distance Learning (SQA 2000).*

Candidates with additional support needs

This Unit specification is intended to ensure that there are no artificial barriers to learning or assessment. The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Alternative Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs,* which is available on SQA's website: **www.sqa.org.uk**.

General information for candidates

Unit title: Quality Management: An Introduction

Quality systems are used in all organisations and this Unit is intended to give you an insight into how quality is integral in meeting customer requirements for all products and services.

You will be introduced to the fundamental principles of Quality Assurance and Quality Control and how these apply to BS EN ISO 9001. You will also learn how these principles are applied in practice when an organisation applies for accreditation to BS EN ISO 9001. The steps taken, timelines and how a quality system is built up will enable you to discover how an organisation creates a quality system and how it develops into the kind of culture that is necessary in modern industry.

Once you are familiar with the fundamentals of quality, you will learn different methods of controlling a process and how to gather information and data to help you with this. You will learn several methods of gathering data and how best to interpret that data and also how the different methods are applicable to different situations and organisations. As you progress you will be introduced to Statistical Process Control and its uses in processes.

Finally you will learn about quality costs, how to interpret and evaluate them, how to categorise them and show them in a way which is easily understood.

By the end of this Unit you should possess the knowledge and understanding to enable you to:

♦   explain quality system elements and principles
♦   explain the operation and application of BS EN ISO 9001 and how an organisation gets accredited to the standard
♦   understand different ways of getting and interpreting data to control a process
♦   understand the way in which SPC is used to control a process
♦   describe, interpret and evaluate quality costs

Formal Unit assessment will consist of written tests for Outcomes 1 and 3; an assignment of between 800 and 1,000 words for Outcome 2 based on a case study of a new company going for BS EN ISO 9001 and a case study for Outcome 4 based around the interpretation and evaluation of quality costs. The assessments for Outcomes 1 3, and 4 will be conducted under controlled, supervised, closed-book conditions. The assessment for Outcome 2 will be an assignment completed outwith class time.