

AQS 110 FALL 2016 -- Module 2 Study Guide (Exam Review)

This study guide is meant to guide you when in studying for the exam. I hope you find it helpful. It is not a contract of what content will or won't be on the exam. The questions on the exam will be from the topics below.

Textbook – Metrology Handbook

Chapter 5, 6, 9, 10, 11, 14, 16, 18, 19

17 (pgs 107-120), 20 (pgs 153-154), 21 (pgs 171-172)

Additional reading material (hand-outs posted on blackboard)

“Sampling” excerpt from Juran’s Quality Handbook

“Inspection” excerpt from Certified Quality Inspector

Module 2 Slide deck

Why Measure? ... Quality determined by customer (end-use) based on their expectations & needs...

- Fit -- fitness for use, fit between components, etc.
- Form -- free of defect, color, shape, etc.
- Function -- work as intended

Process Change / Variation

- Materials, machines, methods, measurements, personnel, environment

Definition:

Measurement is a method of evaluating property/characteristic of an object/service and describing it with a numerical or nominal value.

Metrology - General

- Science of measurement: Internationally accepted units (7 basic units, recognize these)
Realization in practice (tools)
Traceability chain to reference standards (know the pyramid)
- Applied/Industrial metrology - know the definition, why is it important
- Recognize ISO 17025:2005 as the definitive document
- Accuracy versus Precision

Specifications –

What are they and information they may contain?

How are they used by various industries and internal departments?

Drawings – recognize basic GD&T symbols, identify various areas on print

Tolerances: unilateral, bilateral, limiting

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Measurement Fundamentals: "how to trust the results"

Various tools and types of measurements

How each of the following can impact the result and what needs to be considered when evaluating a products:

Methods

Equipment specifications

Confidence (Quality) - distinguish the various error types

Environmental Controls - effect on tool and characteristic to be measured

System,

Capability – distinguish various error types

Standards Usage - understand the pyramid

Data –

Unit conversions, rounding rules

Considerations - format, resolution, readability, suitability, confidentiality

Calibration

1. Parallels with Measurement Fundamentals
 - Adequacy of Standards (i.e. 10:1, 4:1 ...)
 - Methods
 - Traceability
 - Uncertainty (influences, magnitude, type)
 - Environmental Controls
2. Unique to Calibration
 - External Vendor or Internal Dept. program
 - Intervals
 - Scheduling
 - Labels

Software Validation - considerations

Inspection Systems & Samplings

Inspection process

Characteristics – critical / major / minor

Inspection type

Inspection Points

Conducting (qualitative, quantitative, destructive, non-destructive)

Flow chart(s), check sheets

Sampling

Define sample

100% vs using a plan

Sampling strategy / logistics

Consumer Risk vs Producers Risk