

**-SQA-SCOTTISH QUALIFICATIONS AUTHORITY**

**Hanover House  
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GLASGOW G2 7NG**

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**NATIONAL CERTIFICATE MODULE DESCRIPTOR**

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**-Module Number-  
-Superclass-**

**0074630  
VE**

**-Session-1987-88**

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**-Title-**

**DIMENSIONAL CONTROL 1: MEASURING AND  
TESTING (x<sup>1/2</sup>)**

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**-DESCRIPTION-**

Type and  
Purpose

A general module which enables the student to  
acquire basic skills in engineering measurement.

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Preferred  
Entry Level

64800 Engineering Communication (x <sup>1</sup>/<sub>2</sub>)

Learning  
Outcomes

The student should:

1. establish datums and use a reference surface;
  2. select and use gauging, measuring and testing equipment;
  3. know the common sources of error and how to minimise their effects.
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Content/  
Context

Corresponding to Learning Outcomes 1-3:

1. election of appropriate datums such as reference lines, surfaces, holes and points. Co-ordinate dimensioning: rectangular and polar. Use of basic trigonometry. Care and use of reference surfaces and associated equipment.
2. Care and use of basic measuring equipment including micrometer and vernier instruments, and dial test indicators. Care and use of gauges, squares and test mandrels.

3. Sources of error and factors affecting the accuracy of gauging and measuring namely:
  - (a) the effects of heat due to excessive handling, the manufacturing process and the environment;
  - (b) excessive force;
  - (c) misreading;
  - (d) poor technique;
  - (e) dirt, grease, etc.;
  - (f) wear and tear. Calculation of error due to heat.

Suggested  
Learning and  
Teaching  
Approaches

The module activities should be experienced in an environment appropriate to the learning outcomes.

Each skill should be demonstrated to the performance standard required and followed by supervised participation by the students in the skill areas covered.

The need to work logically and in an orderly manner should be emphasised.

Students should be encouraged to discuss problems, exchange ideas, assist each other and make decisions.

Safety, safe working practices, care and use of equipment should be an integral part of all activities.

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each learning outcome.

The following abbreviations are used below:

LO Learning Outcome  
IA Instrument of Assessment  
PC Performance Criteria

LO1 IA Practical exercise in conjunction with an observation checklist for a given component(s) with a range of linear and angular features.

- PC The student:
- (a) selects suitable datums;
  - (b) accurately determines and records co-ordinates of specified features;
  - (c) satisfactorily sets-up the component on a reference surface.
- LO2 IA Practical exercise in conjunction with an observation checklist for a given component where lengths, external and internal diameters are to be measured.
- PC The student:
- (a) selects appropriate measuring and testing equipment;
  - (b) measures and gauges lengths and external and internal diameters to a standard of accuracy appropriate to the type of measuring instrument;
  - (c) satisfactorily records measurements and gauging decisions.
- LO3 IA Short answer questions of a minimum of five.
- PC The student:
- (a) correctly states four main sources of error and how they could be minimised;
  - (b) determine by calculation the amount of error due to heat.