

Research and Information Services

MONITORING STANDARDS REPORT



Mathematics for Engineering (G7E8 and G0DR) and Statistics for Science (G7V9 15)

Introduction

A Scrutiny Panel, consisting of two members of SQA's moderating team and an external specialist in the field judged assessment material and candidate evidence against the standards of units:

- ◆ **D4JH 04:** Mathematics for Engineering (HNC Engineering: Electrical GODR)
- ◆ **DG4H 33:** Mathematics for Engineering (HNC Electronics (new) G7E8)
- ◆ **DN8C 34:** Statistics for Science (HNC Applied Science (new) G7V9)

Centres were asked to provide evidence for two candidates for each of the units.

1 **Quality of collected material**

The majority of material ranged from satisfactory to good, although the limited amount of material for the second and third units gives little basis for conclusions.

2 **Assessment instruments**

In general, most were fit for purpose, well presented and appropriate to level of demand. A very small number lacked harmony between unit specification requirements and question structure. Several lacked clear guidance on criteria for pass, and information concerning closed-book conditions and timing - though these guidelines may have been issued to students separately.

3 **Evidence of candidate performance**

This was largely in line with national standards. Some examples of good practice were noted: clear mathematical rigour demonstrated by more able students, understanding of theory applied to contextualised questions.

4 **Assessment decisions**

Mostly accurate and consistent within and across centres. There were two instances where the Scrutiny Panel disagreed with the assessment decision: the first where seemingly overgenerous re-sit opportunities were given without explanation of exceptional circumstances, and the second where no working whatsoever was shown to justify (comment) answers/solutions.

5 **Comparing standards over time**

Not applicable as only material for 05-06 was scrutinised.

6 **General comments**

As previously stated, the limited amount of material for the second and third units means that the findings of the Scrutiny Panel are heavily biased in reference to the first unit.

7 **Conclusions**

From this sample, delivery and implementation of these units are in reasonable to good order.

8

Recommendations

The members of the Scrutiny Panel agreed that centres should consider:

- ◆ building on their good work already in place – many are working co-operatively and successfully within the SQA framework to ensure that national standards are maintained
- ◆ proactively seeking SQA guidance for any clarification or detail that would inform both teaching staff and students, where improvements can be made (eg in structure and assessment decisions)

Appendix: Unit report

1 The Units

Unit	Main Purpose	Candidate Profile	Uptake
D4J H04 Mathematics for Engineering (HNC Engineering: Electrical, G0DR)	To: -operate on complex numbers -apply algebraic methods -apply trigonometric methods -differentiate and investigate	No comment	Not known
DG4H33 Mathematics for Engineering (HNC Electronics (new), G7E8)	To: - apply algebraic techniques - handle complex numbers - analyse trigonometric. functions	No comment	Not known
DN8C 34 Statistics for Science (HNC Applied Science (new) G7V9)	To gain an understanding of the application of statistics to science. See unit specification for full details	No comment	Not known

2 Assessment instruments

Unit	Fitness for Purpose/Integration	Quality of Presentation	Level of Demand	Conditions of Assessment	Guidance on Criteria for pass and validity to PCs and range/Summary
D4J H04 Mathematics for Engineering (HNC Engineering: Electrical, GODR)	Fine for all but a minority of cases where assessment instruments (IAs) lacked harmony between specifications, requirements and question structure	Fine in general. One example where presentation lacked clarity due to cross referencing between questions	Fine	In many cases, IAs lacked mention of closed book conditions and timing	Generally fine
DG4H33 Mathematics for Engineering (HNC Electronics (new), G7E8)	The IAs satisfy the unit specification (A small detail – time limit for 01 is stated as 45 minutes but should be 40 minutes.)	Good – clear to read and follow	Appropriate to unit specification	Clearly stated on separate sheet issued to candidates	Very clear and matching unit specification
DN8C 34 Statistics for Science (HNC Applied Science (new) G7V9)	IAs correctly addressed the unit specification	This was, in the main, good	Appropriate for unit specification	Ranged from not specified to appropriate	Ranged from not specified to the inclusion of a mapping from unit specification to assessment questions

3 Evidence of candidate performance

Unit	Accuracy of Assessment Decisions	Consistency of Application of Standards	Examples of Good Assessment Practice/Summary	Comparison Over Time
D4J H04 Mathematics for Engineering (HNC Engineering: Electrical, G0DR)	Of the candidate evidence scrutinised, 2 decisions were debatable. The first where re-sit opportunities appeared overgenerous and the second where no working was shown to justify answers	Fine (apart from points made in 3.1)	For several candidates, level of mathematical rigour was high. Understanding of theory in context was evident	N/A as only 05-06 material was provided
DG4H33 Mathematics for Engineering (HNC Electronics (new), G7E8)	No disagreement with centres decisions	Appropriate for small sample scrutinised	N/A	N/A as only 05-06 material was provided
DN8C 34 Statistics for Science (HNC Applied Science (new) G7V9)	Appropriate and acceptable	In the main, standards were comparable	Provision of: assessment/unit specification mapping detailed marking schedule and sample solutions	N/A as 2005 – 06 is first delivery session for this unit