

GNVQ

Examiners' Report

**GNVQ Intermediate
Engineering**

June 2003

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Chief Moderator's Report

June 2003

Introduction

A team of twenty four moderators including 3 Principals and the Chief were involved in the moderation of portfolios from centres covering Foundation, Intermediate, AVCE and Part one programmes. There was a good level of consistency within the moderation process and this was assisted by the use of a standardisation event at which it was possible to share expertise and understanding.

The three Principal Moderators each held specialist knowledge and therefore acted in an advisory capacity to moderators as and when necessary during the moderation process.

There was a very variable standard of assessment. Assessment at many centres was accurate, however a significant number of units assessed at other centres did not fall within the tolerance accepted by National Standards. In many of cases, these decisions were as a result of inaccurate interpretation of the specifications and in particular the requirements of assessment grids.

The majority of centres that assessed portfolios accurately and within accepted tolerance used assessment front sheets to record achievement against the assessment criteria from the grading grids. There was evidence that some of these centres had successfully used these Front Sheets to provide feedback during formative assessment resulting in greater achievement by candidates. Some centres followed advice from the awarding body and annotated candidates' work to indicate where particular criteria had been met. However a significant number of centres did not provide any indication of how assessors had awarded points scores often resulting in inaccurate assessment.

The use of assessment front sheets is recommended since they can clearly indicate where specific evidence can be found in the portfolio, and also focus on the type of evidence required to meet selected criteria. This practice generally proved helpful to candidates.

Many candidates included information and work that was not relevant to the assessment process and some centres sent artefacts to the moderator. In some cases it appeared that assessors had been influenced by the quality of the end product whereas the specifications require assessment of the processes involved in achieving the end product.

Some superfluous material was produced as a result of centres using assignments that were originally written to meet the requirements of the 'old specifications'. In some cases this proved extremely unhelpful, candidates spending valuable time researching materials that did not provide evidence required by the assessment grids. A small number of centres appeared to have difficulty in differentiating between the current specifications and obsolete specifications. Some annotation referred to Performance Criteria (PC's) and Evidence Indicators (EI's) that do not form part of the current specifications. In general terms assignments written for previous programmes are not suitable for generating evidence for the current programmes.

Many centres failed to differentiate between learning experiences and assessment opportunities and therefore class notes were often included in portfolios. Where candidates were provided with learning experiences that were separate from assessment activities there was generally more relevant evidence in the portfolios and specific criteria were more accurately met.

It is disconcerting to note that some centres did not make sufficient reference to the assessment grids provided in the specifications. These grids provide specific detail of what a student is required to be assessed against. The assessor should only consider the evidence provided against the stated assessment criteria. In all cases the banner should form the basis of the assessment process. It clearly defines the form that the assessment and the portfolio should take. During the moderation process the moderator judges the evidence available against the requirements of the banner and the criteria stated in the assessment grids.

Internal quality control is essential to ensure that there is consistency of assessment across the centre. However it is also essential for centres to sample assignments before they are presented to candidates. In some cases, due to poor assignment design, students met the requirements of the assignment, but not the assessment criteria.

It is an acceptable practise to combine the evidence for two or more different units into one portfolio. However it is essential that assessors provide suitable annotation to indicate achievement relating to each of the units covered by the work. This may best be achieved by the use of specific assessment front sheets and possibly the use of different coloured annotation. It is vitally important that assessors provide specific evidence of assessment for each unit and justification of the scoring achieved across the different units.

Assessors should recognise that when grading candidate's evidence the following general qualities must be considered to distinguish between the different grades:

- Increasing depth and breadth of understanding
- Increasing coherence, evaluation and analysis
- Increasing independence and originality.

There was a normal distribution of grades across the total entry. However some centres were far more successful than others. This situation suggests that some teachers have encountered difficulty in providing students with the opportunity to meet the higher-level criteria, and indicates a need for more support in the form of INSET events.

In some cases there was evidence of the inappropriate awarding of points. The moderator agreeing with the achievement of assessment of criteria, but awarding a significantly different points score. Assessors should refer to the guidance provided relating to the awarding of points against the achievement of criteria. In particular a candidate must achieve all of the C (or Merit criteria) before being awarded a C (or merit) grade. This was sometimes not the practice and resulted in assessment being out of tolerance.

Witness Testimony

Witness Testimony is a very useful support for evidence of the use of practical skills and achievement. However these statements should be detailed and must contain reference to the criterion/criteria being supported by the statement. In many cases assessors ticked a copy of the assessment grid and initialled this tick. This practice is not acceptable and does not meet the requirements of National Standards.

A **witness statement** is a document which records statements of learner performance. It is completed by someone other than the assessor of the qualification. This may be someone who does not have direct knowledge of the assessment evidence, but who is able to make a professional judgement about the performance of the candidate (for example, a work placement supervisor, technician, or librarian).

The quality of a Witness Statement can be greatly improved if the 'witness' is provided with the assessment evidence from the specification so that accurate reference can be made to this in relation to the success of learner performance when recording details on the Witness Statement.

A Witness Statement does not confer an assessment decision. When making an assessment decision the assessor must consider the validity of the information contained in the Witness Statement, noting the relevant professional skills of the 'witness', along with any other supporting evidence before making the final judgement.

A Witness Statement must be signed and dated by the witness together with clear details of their job role. They must also be signed and dated by the assessor.

It is the responsibility of the assessor to ensure the authenticity of Witness Statements.

An **observation record** is a document which records statements of learner performance. It relates directly to the criteria contained in the Assessment Evidence grid included in each Unit Specification. It may confirm achievement or provide specific feedback on candidate performance against National Standards.

Since an Observation Record will provide primary evidence, it is essential that the recording of performance is sufficiently detailed to enable others to make a judgement as to the quality and sufficiency of candidate performance against National Standards.

Observation Records should preferably be accompanied by supporting evidence. This may take the form of visual aids, handouts, preparation notes, cue cards, diaries, log books, and peer assessment records. It is essential that where present, these are included in the learner evidence. Where visual aids and handouts are used, notes should be made on the Observation Record as to how these were used and their effectiveness.

The assessor completes the Observation Record and therefore must have direct knowledge of the specification to enable an accurate assessment decision to be made.

An Observation Record has greater validity than a Witness Statement since it is capable of recording an assessment decision.

An observation Record must be signed and dated by the assessor.

Intermediate GNVQ in Engineering

One hundred and eight centres offering full award programmes provided assessed evidence for moderation from units 2, 3, 5, 6, 7, and 8. No centres provided evidence from units 9, 10, 11 and 12.

Assessment and moderation should be centred on the candidates 'engineering ability' and not their ability to write fluent English. However many candidates, particularly those for whom English is a second language, have difficulty with clear concise communication, and this inability may possibly contribute to their inability to achieve higher grades. Tutors should be encouraged to provide more opportunity for the development of both communication and presentation skills.

Many candidates experienced difficulty in separating general teaching materials from evidence required for assessment purposes. This was particularly evident where several units had been linked for delivery purposes. In many cases this meant that gaps in evidence were evident and also much information was included that was not relevant. There is a need for candidates to learn the skills of portfolio building in order to ensure that only relevant evidence is included. It is also vitally important for centres to ensure that all assessed evidence is supplied to the moderator. Failure to comply with this requirement resulted in assessment decisions being judged severely out of tolerance. When building a portfolio for assessment and subsequent moderation candidates should be encouraged to remove all evidence from files and plastic wallets. The **relevant** evidence should then be organised in a logical sequence, annotated where necessary, and securely fastened, possibly using treasury tags.

There was a tendency for assessors to be slightly generous, particularly when differentiating between bare and comfortable pass achievement. However most assessment was within the tolerance allowed by National Standards.

It is not intended to provide detailed comment on all units. However those presenting significant areas of concern are included in the report.

Unit 2: Application of New Technology in Engineering

This unit is the same for both Part One (Unit A) and Full award programmes. In both programmes it is acceptable for candidates to be provided with prepared drawings and information sheets. However at higher levels of merit and distinction it would be expected that candidates produce increasing quantities of original work material such as diagrams and text.

Candidates should produce a case study of the 'new' technology used in making **two** chosen products from different fields. Some candidates investigated only one product and others investigated two products from significantly similar fields and therefore did not meet the banner. Students should be able to choose, with guidance, the technology they want to work with. In many cases large groups investigated particular technologies and therefore it was difficult to distinguish individual input. In these cases assessors should have provided evidence in the form of witness observation/testimony/statement indicating individual achievement. Often assessors failed to record the amount of direction provided or to identify the degree of independence of investigation. Where group work has produced the main evidence it is expected that merit candidates provide evidence of building on the work done by the group.

Some candidates failed to identify the product and/or the technology under investigation and in many cases there was confusion between the product and the technology.

The banner requires that candidates produce information about new technology products. This information should be derived in part from data from suppliers. Many candidates only provided evidence of internet searches not related to the suppliers and therefore did not fully meet the banner. Where it is recognised that candidates are likely to encounter difficulties obtaining information from suppliers they should be guided towards an investigation of different products in order to enable them to meet the requirements of the banner.

Candidates are required to investigate new technology products. This investigation must include both a library type research and a practical investigation of the product. Many candidates did not provide evidence of the practical investigation and therefore did not fully meet the banner or criterion P2. Candidates should be familiar with suitable techniques for recording the process and outcome of practical examinations.

Many candidates did not record the source of their information and therefore did not fully meet the P1 criterion. It is not appropriate to simply provide a bibliography. Candidates should record the source of the information, how it was used in their research and conclusions drawn from the analysis of this information..

Although some candidates were able to provide an analysis of the advantages and limitations of the technology when using the product, few provided more detailed evidence of planning the investigation than a list of proposed activities.

Unit 3: Make Engineered Products

Candidates generally provided good evidence for the manufacture of suitable engineered products that included at least one process from each of the categories: material removal, joining and assembly, treatment processes, surface finishing. However most of this evidence was of a general nature and failed to detail individual achievement in the engineering processes. Witness statements, signed and dated, annotated photographs and detailed student logs needed to be included to illustrate the use of appropriate processes and skills to make and finish the products.

Candidates usually listed the relevant safety procedures and identified the relevant safety equipment to be used in the activities. Some candidates produced detailed risk assessments. This evidence was unfortunately not developed sufficiently to confirm that the candidates had used these procedures and equipment.

Many candidates were not able to produce realistic production plans, producing simply a list of the main stages of manufacture. A production plan developed from the consideration of: materials and component to be used, the processes to be used, the tools and equipment to be used, the sequence of production, production scheduling, how quality will be checked and inspected and health and safety factors. It is recommended that candidates are provided with suitable examples of production planning documents to help them produce the required information. Copies of some common forms of industrially relevant production plans are available from a variety of sources including the Edexcel web site

Quality control procedures were generally clearly identified, but many candidates did not present evidence that they had used these procedures. Records of measurements and inspections, supported by annotated photographs would have satisfied the evidence requirements for use of appropriate quality control during the manufacture of the product.

Unit 4: Applied Science for Engineering

Some centres produced a wealth of evidence towards this unit. However in some cases there was insufficient attention paid, by the provider, to the requirements of the banner and candidates carried out irrelevant work. The banner requires evidence of an understanding of engineering systems that involve forces, motion and electricity. Further clarification of the range and depth of understanding is provided in the 'What you need to learn' section of the specifications.

It is important that candidates identify the major forms of energy in the given engineering systems and describe the energy changes undertaken by the systems.

When designing the programme to provide evidence for this unit, teachers must ensure that all aspects of the banner and the assessment grids can be covered by the candidates. It must also be recognised that differentiation across the grades should be identified by considering:

- Increasing depth and breadth of understanding
- Increasing coherence, evaluation and analysis
- Increasing independence and originality.

Unit 8: Mathematics for Engineering

This unit centres on the application of mathematics to solve engineering problems. In order to meet the requirements of this unit a careful analysis of the banner is essential. Some centres provided a wide range of engineering calculations. However this range must include examples from each of the following areas: **number, geometry and trigonometry, algebra** and **basic statistics** and should consist of solutions for a range of problems **associated with engineering processes**. Far too often candidates performed solutions to pure mathematical problems and therefore did not meet the requirements of the banner.

Many candidates did not produce sufficient evidence of the use of a scientific calculator and often there was little evidence of the use of standard form.

Unit 9: Motor Vehicle Technology

This unit requires the practical investigation of at least **two different** light vehicle systems. The evidence provided should include:

- The type of system layout used
- Major system components
- Diagrams describing the operation of the system.

Failure to meet all of these requirements resulted in severe loss of marks, and caused candidates to achieve lower than predicted grades.

Unit 11: Engineering Project

In order to meet the requirements of this unit, candidates must be provided with clear target criteria. The unit requires a team solution to an engineering design problem, and as such requires suitable evidence of working with others and agreeing logical methods of working together.

Units 5, 6, 7 and 12 were generally covered well and raised few significant problems for deliverers or candidates.

Chief Examiner's Report

June 2003

There were TWO units tested in this series at **INTERMEDIATE** level:

GNVQ Intermediate	E201T	Design & Graphical Communication
GNVQ Intermediate	E204T	Applied Science & Mathematics

Comments on individual tests are given below but the general performance was an improvement on the JUNE 2002 series and candidates were prepared more thoroughly by most centres.

The **pre-release element** of the test for unit E201T always causes a variety of problems for the examiners. Some of the problems in previous series have been reduced but other problems are becoming more common. The problems can be separated in to two broad categories:

- i. interpretation of the technical requirements and
- ii. administration or clerical errors.

The **Technical Design Specification** is not fully understood by many candidates. Often the candidates restate the design brief and follow this by a list of general points about the contents of the ultimate design. Centres should advise candidates of the need to state clearly the key technical details of how they intend to satisfy the needs of the design brief. The section "**Design brief**" in the unit gives useful guidance on the details required. Sketches of **initial design ideas** were generally well done but some did not show the key features e.g. position of flashing LEDs. Some candidates showed a second sketch with little or no difference to the first one.

The **Materials and Components** lists were done well in most papers but some omitted vital parts and others failed to give quantities or parts numbers.

The **List of Processes** was misinterpreted by some candidates who gave a list of the stages of the design process.

The **final design** drawn on A3 paper was done well by a larger proportion of candidates than in the January 2003 series. There are still some weak areas,

- i. border, scale and title block do not always conform to British or European standards,
- ii. line types are confused,
- iii. dimensioning is often irregular and
- iv. annotation is sometimes omitted.

Some drawings had to be deemed not fit for purpose because key features were omitted and the drawings were in an unsuitable form. When included, electronic circuits were well done and fit for purpose.

Centres are reminded that the design drawing needs to be drawn in accordance with British Standards. Marks are awarded for a proper border, title block with title, scale, projection etc. There is a specification for the border and title block within BS308 part 1 (and its EN equivalent which replaces it). This defines a specific double border with a grid using letters and numbers, and certain registration marks. Students should be producing drawings which use this border and not a simple box as a border. Marks are also awarded for correct use of line types, such as chain lines for centre lines, dashed lines for hidden detail, dimensioning, and correct use of line thicknesses. Students also need to use correct British Standard symbols for threads, springs, resistors, switches, batteries etc. The drawings produced by students suggest that some centre staff seem unaware of these conventions. Some students produced excellent design work worthy of the high marks awarded, but some students produced work which looked as if it had been hurriedly sketched during the

examination itself, and was of very poor quality. These students failed to gain many marks for their design work.

Some centres are still allowing candidates to submit work produced on paper other than in the booklet or A3 sheet provided. This work cannot be marked although examiners were instructed to give the benefit of the doubt to candidates submitting an alternative drawing sheet rather than an additional one. Some centres provided candidates with a pre-printed drawing sheet containing a border and title block, these candidates could be given no marks for these categories. Most students produced final designs on the AB40 form (a piece of A3 drawing paper) provided with the answer books. Students are advised to use the blank side of that sheet for their drawings, and fill in their student details in the pre-printed block on what will then be the reverse.

Unfortunately some centres seem to have provided students with photocopies of the answer booklet. All centres entering students for this test are provided with answer booklets and drawing sheets for their candidates, and it is disappointing to see that these were not used. Some students submitted drawings produced using CAD facilities. The instructions are clear and specific, students are required to produce original hand drawn drawings. Those students who submitted CAD drawings were unable to gain the full marks for their drawing work.

The declaration to be signed by both candidate and teacher authenticating their independence of the candidates work went unsigned in many cases. The Principal Examiners for the design papers took a lenient view of this omission because of the large number of cases and allowed the candidates to receive the full allocation of marks for the paper in this series. **In future series the rule stated on the pre-release booklet will be applied and no marks will be given for the whole test.**

Some centres allowed candidates to use cut and paste methods to insert material into the pre-release answer booklet. Candidates were not penalised for this if it was clear that the work was individual and no extra pages were used.

Again some candidates submitted no pre-release work whatsoever. The ruling on this was applied rigorously and candidates received no marks for the whole test. It was however evident that fewer candidates than in previous series failed to submit any pre-release work. Centre staff should be aware that the rule applied in other areas which allows candidates to use pre-release material submitted for a previous series does NOT apply in GNVQ/VCE Engineering. ALL candidates must submit original pre-release work WITH the examination script as instructed on the front of the examination paper.

E201T Design & Graphical Communication

Principal Examiner's Report June 2003

	Distinction	Merit	Pass
Upper	120	74	58
Lower	75	59	44
Cum%Cands	16.9	48.8	77.5

Details of the standard of the pre-release work are given at the beginning of this report.

There was some evidence that some teachers were providing students with a model solution. This is unacceptable. Students must produce design work that is their own individual work and not the teacher's work, or the result of group work. **When identical design work is found in student's scripts then these students will be awarded zero marks for the whole test – as they would be if they submitted no design at all.**

In the external test students were asked to sketch the standard symbols and conventions used to represent features, used in engineering drawings. Many students were able to sketch electrical symbols but few were able to sketch other features or mechanical symbols. Later questions required students to explain features of their own design, related to specified criteria. Many students were unable to do this and answered the question in isolation – without using the information from their own design work. The answers to this type of question must fit with the information provided in the students design work. Students whose design work does not conform to the requirements of the design brief are at a disadvantage when answering these questions.

The external assessment for this unit is focussed on the design work that students carry out before the test. The importance of students producing real engineering design work is fundamental to gaining a good mark in this test.

In general it was pleasing to see that the majority of candidates attempted all the questions on the paper and the responses were usually relevant. There have been some papers in previous series where many questions were not attempted, thus it is apparent that most candidates are now better prepared for the test.

E204T Applied Science & Mathematics

Principal Examiner's Report – June 2003

	Distinction	Merit	Pass
Upper	70	58	43
Lower	59	44	29
Cum%Cands	7.5	37	73.9

The paper allowed the majority of candidates to answer all questions and the overall achievement was an improvement on the previous June series. For the first time a candidate achieved full marks, the candidate Martin Stephen Hodder deserves congratulations as do the staff at centre number 19940. As with the foundation candidates the main weakness for other candidates is the knowledge and understanding of units and their importance. Again as with foundation candidates the main strength was the ability to draw graphs.

The examiners made the following observations on the responses to individual questions.

- Q1** Most students could convert millimetres into metres, although some used a conversion factor of 100.
- Q2** Most candidates know the meaning of a.c. but a significant number think it is alternative current
- Q6** Graphical question; well done by the majority of candidates. The main error is where candidates write the values straight from the table on to the axes at regular intervals thus ensuring a perfect straight line every time
- Q7 (a)** Many candidates invert the efficiency relationship and calculate efficiencies greater than 1 or 100%.
- Q8** Using $F = mg$ caused problems for a surprising number of candidates and many different units were seen.
- Q9** Many students were confused with the substitution of numbers into the v^2 part of this formula. Some squared every number in the formula others just doubled the velocity.

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