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Introduction

Our Moderators' reports are produced to offer constructive feedback on centres' assessment of moderated work, based on what has been observed by our moderation team. These reports include a general commentary of accuracy of internal assessment judgements; identify good practice in relation to evidence collation and presentation and comments on the quality of centre assessment decisions against individual Learning Objectives. This report also highlights areas where requirements have been misinterpreted and provides guidance to centre assessors on requirements for accessing higher mark bands. Where appropriate, the report will also signpost to other sources of information that centre assessors will find helpful.

OCR completes moderation of centre-assessed work in order to quality assure the internal assessment judgements made by assessors within a centre. Where OCR cannot confirm the centre's marks, we may adjust them in order to align them to the national standard. Any adjustments to centre marks are detailed on the Moderation Adjustments report, which can be downloaded from Interchange when results are issued. Centres should also refer to their individual centre report provided after moderation has been completed. In combination, these centre-specific documents and this overall report should help to support centres' internal assessment and moderation practice for future series.

General overview

It is important for moderators to receive candidate work from centres by the deadline date. Delayed submission of samples slows down the moderation process, and the resolution of issues should they arise during moderation.

Centres should check carefully what sample work is being requested for moderation and make sure that the correct sample of candidates is sent to the moderator.

A completed Unit Recording Sheet (URS) is required for each candidate in the requested sample. Without a correctly completed URS for each candidate moderation cannot take place and will be delayed.

Please make sure that all candidates are correctly identified on their paperwork with the correct candidate number. This includes in the naming of electronic files.

Clerical errors
Please check carefully the addition of marks on the URS and their transcription to Interchange. If they are incorrectly totalled or transcribed, we will need to reconfirm them with centres at moderation. This introduces delay to the moderation process.

A copy of the IMS1 mark sheet generated by Interchange should be sent along with the sample to your moderator so they can check the sample received is correct.

Marker comments on the URS
Marker commentary on the URS, along with clear indication of how the mark given is derived, helps greatly with the moderation process. Page numbers of where evidence can be found in the candidate evidence is also extremely useful. Candidate work can also be directly annotated showing where each LO and mark band is being addressed.

Centres are reminded that work cannot be double counted, and if used as evidence for one LO, it should not be used for others. This is also the case for work that overlaps with more than one LO or Unit within the qualification. Work that is double counted might be discounted if found during moderation, thereby disadvantaging the candidate.

Internal standardisation
If more than one internal marker is marking a cohort of work, it is crucial to standardise marking across markers. Internal standardisation ensures that the marks presented are accurate and consistent, and that the rank order of marks is maintained. If there was only one marker, it is still sensible to have another qualified member of staff within the centre to look over the marking. Rank order errors are referred back to the centre by the moderator and often require the centre to remark work, thereby delaying the moderation process.

Photographic evidence should be annotated by the candidate to explain what is being presented. It should also clearly identify the candidate using their candidate number.

Authentication

It is essential that candidate work is authentic. This means that it is individually undertaken by that candidate, and that sources of information are referenced. This is not only good practice but avoids the risk of penalties being applied. Moderators check for authenticity during moderation, referring any suspected cases to OCR for further investigation. This will delay moderation and may have serious consequences for the centre and candidate.

Centres are encouraged to use the witness statements included with the Live Assessments to support and corroborated candidate-generated evidence. They can also be used to support any other LOs as appropriate, and centres are permitted to modify them to suit their own needs.

Witness statements

Witness statements are used to support and corroborate evidence produced by candidates and are useful where this evidence is difficult to show directly. Examples include working independently, working safely and producing high quality finished items. They cannot be used as a direct source of evidence when the candidate is able to produce evidence themselves. Through moderation marks will be altered to take account of witness statements that are not used appropriately, where there is no candidate evidence to support the relating internal marks.

Full guidance on how to use witness statements correctly can be found in Appendix A of the Specification Handbook, with further guidance on the OCR website.

Unit R114 General overview

There was good evidence in this unit of candidates being able to use software to create and simulate an electronic circuit, and to produce a PCB layout. Step by step evidence of safely making and populating the PCB was sometimes a little disappointing, as was evidence of testing and evaluation.

Comments by Learning Outcomes

LO1 – Be able to use CAD for circuit simulation and design

For LO1 there was often good evidence of candidates being able to use software to create a circuit schematic diagram, and the circuit being simulated. Occasionally there was limited evidence of simulation, or of any circuit modification through testing as is required for this LO.

The LO also requires candidates to demonstrate how they can use software to produce a PCB layout – which should include both track and component views. Annotated screenshots are an effective way to illustrate simulation and show PCB layout production. Review of the PCB layout to ensure correct functionality is also a requirement of this LO; an aspect that was often overlooked.

LO2 – Be able to construct circuits

This LO asks candidates to safely manufacture a blank PCB and to populate the PCB using suitable components. Whilst it was often clear that candidates had done this, their submission often lacked evidence of safely making the PCB (e.g. by etching or milling).

Candidates need to clearly show step by step evidence of making the blank PCB, testing the blank PCB and then populating the PCB with components. Health and safety is an essential requirement of this LO, and can be addressed using risk assessments.

Annotated photographs are an excellent way for candidates to show step by step evidence of the above and can be supported using a witness statement to corroborate safe and independent working. Please make sure that the witness statement is used correctly.

	OCR support	Witness statements:
		Full guidance on how to use witness statements can be found in Appendix A of the Specification Handbook.
		It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.
	AfL	High quality circuit:
		High Quality in the context of the final part of this LO (mark band 3) refers to being able to produce a fully operational circuit.
		Please refer to the Assessment Guidance in Appendix B of the Specification Handbook and read this in conjunction with the Marking Criteria and the Unit Specification to see what is required.

LO3 – Be able to test electronic circuits

LO3 requires clearly presented evidence of testing, which could include visual inspection and taking of measurements using suitable instrumentation (e.g. multimeter, oscilloscope, logic probe).

In a few cases, there was limited evidence of testing and little or no measurements recorded.

An effective way to produce evidence for this LO is for candidates to include annotated photographs showing testing taking place, and for them to produce a table of readings – comparing actual with expected values.

Measurements should be accompanied by an evaluation of the operation of the circuit to secure marks in the higher mark bands.

Again, this LO can be supported with a witness statement, remembering this can only be used to support and corroborate candidate-generated evidence. It cannot be used as a substitute for this.

LO3 – Be able to test electronic circuits

Unit R115 General overview

The descriptive parts of this unit were often well attempted with candidates being able to effectively research the application of computers in design, manufacturing, process control and maintenance. There were also good examples of candidates being taken on industrial visits to see this in action in the real world. The practical aspects of LO2 perhaps require some attention though.

Comments by Learning Outcomes

LO1 – Understand how computers are used in engineering design, manufacture and process control

In this LO candidates are required to demonstrate understanding of how computers are used within engineering design, manufacture and process control. This was often well attempted with examples including CAD, computer aided manufacturing (CAM) and computerised process control. There were a few instances, however, where candidates did not address all three areas – which is essential to secure higher marks.

LO2 – Understand how computers are used for maintenance of engineering systems

In LO2 candidates are required to show they understand the application of Human Machine Interface (HMI) and expert systems in maintenance. These were often well described, with a good range of examples.

The LO also requires that candidate's access and interpret data from a system and make recommendations for corrective actions. Consequently, this requires that candidates are given access to maintenance data, which centres will be required to source. Examples include engine management system fault codes (e.g. OBD reader), machine fault codes and other fault code data. Examples often seen, such as interpreting fault codes from a laser printer or photocopier, are perhaps a little limiting in their scope.

Clear evidence of interpreting what the fault code means, along with suggesting corrective actions is required to fully address this LO. Several fault codes should be interpreted and analysed. Evidence could be presented in the form of annotated photographs or screen shots. Please remember that candidates must present direct evidence, and that the witness statement should only be used to support things like safe working.

	OCR support	Witness statements:
(i)		Full guidance on how to use witness statements can be found in Appendix A of the Specification Handbook.
		It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.

LO3 – Know how computers are used to communicate and use data for production and maintenance

LO3 requires candidates to explain how computers exchange data during manufacturing operations, and how they communicate and exchange data during maintenance operations. In some cases, both forms of communication were not clearly identified. They are also required to explain how production data is used in maintenance operations, and how hand-held devices are used in both manufacturing and maintenance systems. Candidates need to address all these points to secure access to marks in the higher mark bands.

Due to the multiple elements this LO is asking candidates to consider, it would be useful if they use headings in their presentation to clearly show their responses e.g.

- How computers communicate and exchange data during production operations.

- How production data is used in maintenance operations.

- How computers communicate and exchange data in maintenance operations.

- How hand-held devices are used in manufacturing and maintenance systems.

LO3 – Know how computers are used to communicate and use data for production and maintenance

Supporting you

For further details of this qualification please visit the subject webpage.

Review of results

If any of your students' results are not as expected, you may wish to consider one of our review of results services. For full information about the options available visit the OCR website. If university places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications.

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