James Watt School of Engineering
Marking Exam Papers
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Introduction

In recent years the James Watt School of Engineering (JWSoE) has been criticised by External Examiners for not having explicit rules on how exam papers should be marked. Previously the JWSoE has had recommended guidelines but staff were not required to follow them. Staff will be required to follow these instructions.

Why Have Marking Instructions?

There are multiple objectives when marking exam papers. Some of these are associated with achieving a correct mark for the work, some are concerned with leaving an auditable trail to evidence the marking process and others are about ensuring students receive appropriate feedback:

- Ensuring everything that a student writes is considered and, if appropriate, marked
- Ensuring that the marks are correctly totalled
- Ensuring that the second marker (mark checker) knows what to expect and can check that the marks are correctly allocated and added up
- Ensuring that External Examiners and other external assessors (PSR and accreditation), when looking at scripts, can audit the marking easily to assure themselves that the process has been completed according to these requirements
- Ensuring that students can check their scripts and clearly see that all their work has been marked, marks correctly allocated and totalled, and that this process has been checked
- Ensuring that students can see where they lost marks

In order to achieve the above we need to have a consistent marking policy that is effective for each of the types of exam that are undertaken in the School (at some point we may extend this to coursework). Types of exam included are:

- Exams written in traditional script books
- Exams undertaken on A3 Teleform sheets
- Exams written by students on paper and uploaded as PDF files
- Other type of exam where students are manually marked

These instructions do not cover marking/feedback for multiple choice questions or online Moodle quizzes. Separate instructions for these activities may be developed in future.

Approach to Marking

Marking should be "positive" in general, meaning that marks are awarded for work correctly done as shown on the marking scheme rather than deducted for errors. Small deductions from the marking scheme may, however, be made for minor errors. Examples are:

- missing or incorrect units or multipliers
- poor arithmetic (significant figures, accuracy)
- bad mathematical form ($\sin \theta = 0.5 = 30°$ for example)
- working that follows a correct answer

No marks should be awarded after a serious conceptual error or incorrect principle, however, it may be possible to "recover" in a subsequent part of the question.

Marking should follow through if a minor error has been made, such as in arithmetic or transcription, but should stop on a major error or one that changes the solution of a subsequent part significantly.

- For example, if a minor arithmetic error is made near the start of a solution (or a wrong value carried froward from a previous part of the question) but everything else appears to be correct, it should be awarded full marks less a small deduction for the error
- Candidates should not be penalised severely for repeated errors of the same type, provided that they do not invalidate the subsequent solution
- The marker is not expected to develop a new solution following an error by the candidate and no marks should be awarded when it is no longer clear that the candidate's solution is correct
- Further marks should not be awarded if the error changes the nature of the solution. For example, if a resonant system is underdamped but an error makes it appear to be overdamped, the subsequent working is too different to be considered.

No marks are awarded for irrelevant material.

- For example, if a question is concerned with the failure of a structure under compression, no marks are awarded for consideration of failure under tension; in some cases this may be a genuine error but this rule is to avoid rewarding memorised answers to (irrelevant) past questions
- In particular, no marks are awarded for "effort", despite a widespread belief among students that we do this.

Marks should be awarded for any correct method that is consistent with the question, even if it is not the method set out in the marking scheme.

- If the question specifies a particular approach, no marks are awarded for other approaches, even if correct.

First Marking Procedure

- Marks must be allocated in accordance with the mark schedule that is included in the exam paper and the marks breakdown given in the solutions produced by the examiner and seen by the External Examiner
- First marking should be done in RED pen or RED electronic mark-up
- Check marking should be done in GREEN pen or GREEN electronic mark-up (to distinguish it from the first marking)
- The left-hand margin, or the left-hand side of the page should be used for writing marks to be totalled. Subsection marks or indications showing where marks have been gained or lost may be in the main body of the script or on the right-hand side of the page

What to Mark

When marking in Script Books:

- The student should have written in the questions that they have answered in the order that they answered them. If the student has not done this, the marker should use a black or blue pen to write in the numbers. If the student has continued a question later in the book, then the question number and "(cont)" should be written in the box.
- In script books the left-hand page is designed for rough work. It should not be marked, but some students use the left-hand page for work that they expect to be marked. Markers should look at working on the left-hand page and if it is clear that it is part of the main answer (e.g., continued from the previous page) then the page should be marked in the normal way. Markers should also indicate (using a red line or other appropriate method, that they have seen and noted the workings.
- During the exam students sometimes cross out correct work and then either do not re-attempt the question, or re-attempt the question and get the answer wrong. Markers should review work crossed-out and exceptionally may decide to award some marks (but not all) for that part of the question.
- Instructions on the front cover of the Script book say that all writing must be in ink. Some students work in pencil and then may or may not go over it in pen. Work in Pencil should be marked as normal and the instruction on the front cover of the script book circled.
- Where students have a choice of questions to attempt, there are always a few students who do not follow instructions and answer too many questions. Two main approaches are taken by markers:
1. mark all the questions and choose the best
2. consider the questions in the order that they were attempted and take the first ones that match the requirement for the exam.

    Lecturers should ensure that students are informed of the approach that will be taken by markers in each exam. Where no information is given to students all questions should be marked and the best ones chosen (option 1 above).

Marking Exams Scripts in Script Books

- Do not open the strip that covers the student's name. This should only be done where the Student Number is incorrect or illegible. In this case it should be done in the Teaching Office and witnessed. A record of opening of the strips should be maintained by the Teaching Office.
- All writing by the candidate in the script must be tagged to show that it has been read by the marker. Put a line down the right-hand side of each page if there are no other marks or comments nearby.
- Each part of each question in the script should be marked ticking correct answers, identifying where answers are incorrect or where errors occurred and making any comments that the examiner feels is necessary to explain the marks awarded.
  - Remember that this must be clear to an external examiner or other auditor (and it is useful if it is clear to the student who may view the script).
  - A simple cross or similar may be sufficient if the error is obvious from one line to the next, perhaps with an arrow for clarity, otherwise, a word or short phrase may be needed. You may also choose to underline the wrong part.
  - Never write any comments of a personal nature concerning the student or vent your frustration with what has been presented.
  - If an incorrect answer is accepted because of an earlier slip that has already been penalised (the 'follow-through' principle), write something like 'allow' for clarity, use a tick with a cross through it, or a tick in brackets.
  - Intermediate marks may be awarded, and these should be simple numbers placed to the right of the page. They should then be summed to get the mark for that part of the question.
  - All marks on the main page and to the right are for information and clarity of the marking process.
- For each part of a question the total marks awarded should be shown in the left-hand margin with an "out-of" mark as a fraction, e.g.,

$$\frac{3}{5}$$

  - If the student did not attempt a particular part of the question, then the mark of zero should be written down, e.g., 0/4.
  - Where there are many parts of the question missing, the marker should indicate which parts are missing and the "out-of" marks may be combined, e.g., parts (d), (e) and (f) 0/12.
  - The "out-of" marks must match the corresponding marks shown on the exam paper.
  - The marker should draw a horizontal line at the end of a question. If there are parts missing, then a note to this effect should be added. If the question is continued later in the script book then this should be noted.
  - All marks on the in the left-hand margin are marks allocated for particular parts of the question and the total for the question.
- A total mark for each question (integer only[1]) should be written at the end of each question in the left-hand margin. The mark should be written with the "out-of" mark and ringed to identify it as the total for the question.

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[1] Half marks may be awarded for parts of the question, but the total should be rounded to an integer

This mark should then be transferred to the front of the book. If the answer is split in the book and continued later a tick on the front cover should indicate that that section of the question has been marked.

- When the marking of the script is complete the final marker (or marker if there is only one) should check the script to ensure that all pages with student writing on them show an indication that they have been considered by the marker. This may be by comments in the script, marks awarded, or by a red line down the right-hand side of the paper.
- Where a cancelled or crossed out mark is on the paper the marker should initial[2] the change to indicate confirm the new mark.

Marking Exams Scripts in Teleform Sheets

The general rule for Teleform sheets is to use the same marking guidelines for Script book with the exception that the total mark for the question should be written clearly in the box at the bottom centre of the page which contains the beginning of the question. There is no transfer of marks to the front cover as this is done by scanning writing in the "total" box.

Marking Online Exams

The approach to marking digital exams should follow, as closely as possible, the rules for marking Script Books. Marks for totalling should be on the left of the page with comments and, if required, the red line to indicate it has been seen on the right side of the page. The total for the question should be written in the same way as in Script Books: ringed and with an "out-of" mark. The total for each question should be transferred to a spreadsheet.

Recommendations for the best software/hardware to enable efficient digital marking is beyond the scope of this document, but advice and be sought from the "Online Essentials" Moodle pages and IT support.

Marking Exams on Paper

The approach to marking paper scripts should follow, as closely as possible, the rules for marking Script Books. Marks for totalling should be on the left of the page with comments and, if required, the red line to indicate it has been seen on the right side of the page. The total for the question should be written in the same way as in Script Books: ringed and with an "out-of" mark. The total for each question should be transferred to a spreadsheet or collated in the agreed way for that exam or set of exams (e.g., GC UESTC may collate results in a different way).

Second Marking (Check Marking)

Other than for project marking we do not do second marking of assessments within the School of Engineering. What is sometimes called "second marking" is really "check marking". Check marking may be done by an academic or, in the case of Teleform sheets, by Teaching Office staff. The allocation of second markers is beyond the scope of this document. The purpose of check marking is to ensure that:

- the marker has correctly marked the script
- hasn't missed any work by the student

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[2] GC UESTC should sign or print their full name

- has correctly added up the marks for each question
- has correctly transferred the mark for the question to the front cover of the script book
- has correctly added up the total on the front cover of the script book

To do this the second marker, working in GREEN, should

- check the script for work by the student not marked by the marker. The check marker should draw a green line down the right side of each page he has viewed and confirmed as marked
- check that the total of the "out-of" marks used by the examiner adds up to the total marks for the question
- check that the marks for the question are correctly added up. To indicate this the check marker should put a tick beside the circled total for the question
- check the mark for each question is correctly transferred to the front cover and that the sum of the marks on the front cover is correct. In each case there should be a tick beside the red marks to indicate that this has been checked
- when check marking Teleform scripts, the check marker only needs to check that the marks are correctly added up and entered legibly in the total marks box. Teaching Office staff check that the mark has been correctly recognised by the scanning software and transferred to the spreadsheet
- when check marking electronic marking, the check marker should check to marking on the electronic script and that the totals are correct and that they have been transferred correctly to the spreadsheet against the correct student.