MSc CS+ Project 23-24

Assessment Guidelines for Students, Supervisors and Readers

1. Introduction

All MSc CS+ students undertake an independent project in the third semester. For many, this will be the most substantial piece of work they produce in their time at university. This is an excellent opportunity to showcase their computing science skills and expertise, putting into practice what they have learned during their studies to tackle a challenging problem. The aim of the project is not just to address this problem, but to demonstrate excellent use of computing science skills and professional conduct in developing and evaluating a solution.

This document describes the assessment criteria for the MSc CS+ project and provides guidance for students, supervisors and readers.

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2. Assessment

2.1. Assessment Process

The MSc CS+ project will be assessed by at least two examiners (typically the project supervisor and a nominated reader). Examiners will assess the **dissertation** (90% of the overall grade) and the student's **professional conduct** (10% of the overall grade). Both examiners will mark the dissertation, but only the project supervisor will assess professional conduct.

Both examiners will independently assess the project by deciding on a grade band for each assessment criterion and providing written justification. These assessment criteria are weighted to calculate an overall grade.

Examiners need to exercise judgement regarding the difficulty level of the project and the achievements of the student. A less challenging project may be easily completed, whilst a more challenging project may appear incomplete but represent a more considerable achievement.

Students and supervisors should also remember that the main objective of the project is not to deliver an excellent *research output* or *software product*, but to demonstrate an excellent *process* in conducting the work, and in encountering and overcoming significant challenges. Attainment of assessment criteria should therefore be judged accordingly.

2.2. Assessment Components

Assessed work consists of:

- A written **dissertation** with a maximum page limit of 30 pages (not including appendices) (90% overall).
    - Submitted with appropriate source code, supplementary materials, data, etc.

- An appraisal of the student's **professional conduct** during the year (10% overall).

The **dissertation** provides the primary evidence of project outcomes – it is the lens through which project achievements will be judged. No matter how well a student does in the supervisor's eyes, it is the dissertation that will be assessed. It must therefore be possible to justify awarded grade bands from the dissertation, without reference to other achievements or outputs during the project.

The supervisor will also make a judgement of **professional conduct** during the project, reflecting aspects like engagement with supervisor, independence, organisation, and professionalism. These projects are conducted in a professional setting and should be taken seriously.

2.3. Assessment Criteria

A description of assessment criteria and their weightings are provided below. Detailed grade descriptors for each component will be provided in Section 3.

2.3.1. Problem Analysis (15%)

An assessment of how well the student has analysed and demonstrated their understanding of the problem that their project addresses. This reflects their understanding of the project context, the clarity with which they present their thoughts, and the extent to which they formulate and justify a potential solution to the given problem.

Consider: How well has the student analysed the problem and devised a suitable approach for developing and evaluating a solution? Have they surveyed relevant literature, existing products, etc and demonstrated critical insight and understanding of these? Have they used existing knowledge to justify their approach, support claims, etc? Have clear project requirements or research questions been developed?

2.3.2. Outcome (Research Insight or Software Product) (40%)

An assessment of the project outcome and the quality of work leading to this. This will vary from project to project and requires judgement on the extent to which a good outcome has been achieved. This may reflect the quality and rigour with which research is conducted and technical accomplishments in software development. This should consider the quality of the *process* used by the student in conducting their work and overcoming challenges. Project outcomes *must* be appropriately evidenced via the dissertation. For example, the dissertation needs to adequately discuss what was implemented, what work was carried out, what problems were encountered and how they were addressed, how the research ideas or software were evaluated, etc.

Consider: Were research ideas evaluated using appropriate and well-justified experimental methods? Are software or other technical artefacts well designed, functional, reliable – are they *fit for purpose* in addressing the given problem? Does the dissertation describe the design and implementation of these? Does it provide adequate justification for key design decisions? Are technical accomplishments (including solutions to encountered problems) reflected via the dissertation? Was software tested using appropriate evaluation methods? Is there evidence of critical thinking and insight in how the work was carried out and described in the dissertation? Does the dissertation communicate and justify the process used in achieving these outcomes?

2.3.3. Reflection (10%)

An assessment of how well the student has critically analysed and reflected on their evaluation findings and project. This includes judging the appropriateness and depth of analysis, and the extent and quality of critical reflection on the findings.

Consider: Is the evaluation an honest and fair assessment of the work? Does the evaluation or experiment provide sufficient critical insight, e.g., to provide reasonable answers to the research questions or to assess the success of the project outcomes? Does the student demonstrate an understanding of what they found from their analysis? Is there evidence of critical reflection on findings that, e.g., leads to good suggestions for future work? Has the student critically reflected on what they did and learned from this process?

2.3.4. Dissertation Quality (25%)

An assessment of dissertation quality and how well the student has presented their work. This reflects the completeness of the dissertation, its organisation and use of an appropriate structure, the quality of writing, the ways in which complex ideas are presented, and the appropriate use of external references.

Consider: Is the dissertation complete, containing detailed evidence of analysis, outcomes, and evaluation? Is the dissertation well organised with an appropriate structure? Does the dissertation clearly explain the problem, what was designed and developed during the project, and the evaluation? Does the project make good use of appropriate technical imagery and illustration? Are evaluation results presented clearly, including appropriate use of information visualisation? Does the dissertation contain a bibliography and is work appropriately cited?

2.3.5. Professional Conduct (10%)

An assessment of professionalism and conduct during the project. This reflects the student's independence in leading the project, their use of appropriate professional practice (including tools, research methods, software engineering practice, etc), the quality of project planning and management, and the extent to which the student made good use of their own (and their supervisor's time).

Consider: Did the student attend meetings and engage effectively with their supervisor? Did they show up well prepared for meetings and was meeting time used effectively? Were suitable tools used to manage the project (e.g., reference management software, version control software)? Did the student plan the project well and manage their time effectively? Did the student lead the project and work independently?

Note that the MSc project requires full commitment and students are expected to make significant progress each week. Students should not be working full time or undertaking an internship during the project semester. A lack of engagement will be reflected in whole project outcomes, not just in professional conduct.

3. Grade Descriptors

The following tables present grade descriptors for both the individual assessment components and the overall project. Because projects vary so much in content and style, examiners will have to use their own judgement when interpreting these.

3.1. Problem Analysis

A1-A5 Excellent	The problem analysis is excellent. The dissertation shows a comprehensive understanding of context and related work. The approach for addressing the problem is definitely feasible.
B1-B3 Very Good	The problem analysis is very good. The dissertation shows a good understanding of context and related work. The approach for addressing the problem is feasible.
C1-C3 Good	The problem analysis is good. The dissertation shows a reasonable understanding of context and related work. The approach for addressing the problem is reasonably feasible.
D1-D3 Adequate	The problem analysis is adequate. The dissertation shows partial understanding of context and related work. The approach for addressing the problem is just about feasible.
E1-E3 Weak	The problem analysis is rather confused. The dissertation shows an inadequate understanding of context and related work. The approach for addressing the problem is unconvincing.
F1-F3 Poor	The problem analysis is confused. The dissertation shows a poor understanding of context and related work. The approach for addressing the problem is ill-conceived.
G1-G2 Very Poor	The problem analysis is very confused. The dissertation shows a very poor understanding of context and related work. The approach for addressing the problem is very ill-conceived.
H	No significant attempt.

3.2. Outcome (Research Insight or Software Product)

A1-A5 Excellent	The project achieved an excellent outcome and demonstrated an excellent approach in tackling the problem (e.g., leading to excellent technical achievements and/or critical insight).
B1-B3 Very Good	The project achieved a very good outcome and demonstrated a very good approach in tackling the problem (e.g., leading to very good technical achievements and/or critical insight).
C1-C3 Good	The project achieved a good outcome and demonstrated a good approach in tackling the problem (e.g., leading to good technical achievements and/or critical insight).
D1-D3 Adequate	The project achieved an adequate outcome and demonstrated an adequate approach in tackling the problem (e.g., leading to adequate technical achievements and/or critical insight).
E1-E3 Weak	The project achieved a weak or partial outcome and demonstrated a weak approach in tackling the problem (e.g., with limited technical achievements and/or critical insight).
F1-F3 Poor	The project achieved a poor outcome and demonstrated a poor approach in tackling the problem (e.g., with very limited technical achievements and/or critical insight).
G1-G2 Very Poor	The project achieved a very poor outcome and demonstrated a very poor approach in tackling the problem (e.g., with no technical achievements and/or critical insight).
H	No significant attempt.

3.3. Reflection

A1-A5 Excellent	The analysis is very thorough and there is very clear evidence of critical reflection on findings and the project as a whole. There are excellent suggestions for further work.
B1-B3 Very Good	The analysis is thorough and there is evidence of critical reflection on findings and the project as a whole. There are very good suggestions for further work.
C1-C3 Good	The analysis is quite thorough and there is some evidence of critical reflection on findings and the project as a whole. There are some good suggestions for further work.
D1-D3 Adequate	The analysis is just adequate and there is some limited evidence of critical reflection on findings and the project as a whole. There are unconvincing suggestions for further work.
E1-E3 Weak	The analysis is barely adequate and there is no evidence of critical reflection on findings and the project as a whole. There are weak suggestions for further work.
F1-F3 Poor	The analysis is inadequate and there is no evidence of critical reflection on findings and the project as a whole. There are very limited suggestions for further work.
G1-G2 Very Poor	The analysis is worthless and there is no reflection. There are worthless or no suggestions for further work.
H	No significant attempt.

3.4. Dissertation

A1-A5 Excellent	The dissertation is complete, very well organised, very clearly written, and highly literate.
B1-B3 Very Good	The dissertation is complete, well organised, clearly written, and literate.
C1-C3 Good	The dissertation is nearly complete, fairly well organised, mostly clearly written, but occasionally less than literate.
D1-D3 Adequate	The dissertation is partly complete, not very well organised, clearly written in parts, and often less than literate.
E1-E3 Weak	The dissertation is incomplete, disorganised, mostly unclear and mostly less than literate.
F1-F3 Poor	The dissertation is scrappy, disorganised, unclear and less than literate.
G1-G2 Very Poor	The dissertation is very scrappy, disorganised, very difficult to follow and less than literate.
H	No significant attempt.

3.5. Professional Conduct

Professional conduct varies according to supervisor style. Use your judgement to decide what aspects are relevant but be clear with students about what you expect and how you will assess professional conduct if you deviate from these guidelines.

Good professional conduct should demonstrate independence, courtesy, organisation, time management, adherence to legal and ethical guidelines, and technical project management. The following grade descriptors outline expectations for professional conduct. Further guidance follows, identifying questions you may wish to consider when judging professional conduct.

A1-A5 Excellent	The student carried out independent work, was always prepared thoroughly, very effectively applied appropriate tools and made excellent use of your time. For high A grades (A1-A3), this should reflect the level of professionalism you would expect from a professional consultant or PhD student and be genuinely impressive on *all* counts.
B1-B3 Very Good	Work was independent, perhaps with some intervention required to keep things moving. Not all best practices were followed with preparing for meetings or taking meeting minutes, but a clear attempt was shown to use time effectively. Acceptable use of tools, but unsophisticated or overcomplicated use of version control, etc.
C1-C3 Good	A reasonable level of guidance was required with scoping required by the supervisor throughout the project. Meetings were not always useful, or content had to be repeated. Use of tools was present but it was not clear that the student was using them effectively.
D1-D3 Adequate	Significant help was required in planning and running the project. Student was unable to make progress without step-by-step instructions. Suggestions for improvement were not considered. Meetings were sometimes a waste of time and were missed on occasion. Very limited use of tools.
E1-E3 Weak	Only a limited effort by the student in running the project. There was little to no preparation for meetings and minutes were never taken. Incorrect or inappropriate use of tools. Student was rude/uncooperative. Student failed to follow basic professional practices (e.g., failed to get ethical clearance after being informed to do so).
F1-F3 Poor	Student needed a great deal of support throughout the whole project. Meetings were largely wasted. No use of tools. Failed to follow best practices. Could not be trusted to work on their own. Student failed to communicate or was wilfully obstructive.
G1-G2 Very Poor	Student did not take any responsibility for the project. Student was hostile or effectively absent. No understanding of appropriate tools. Serious violations of basic practices, even after warning.
H	Should only be awarded if the student was never seen during the project – this should never happen!

3.6. Overall

The overall grade is calculated automatically by weighting the components described previously. The following grade descriptors are provided for reference only.

A1-A5 Excellent	An excellent project. Few errors. Shows good judgement and skill in the methods used. Note that A1 or A2 indicates a *truly* outstanding and challenging project, definitely worthy of wider dissemination.
B1-B3 Very Good	A very good project. Some flaws but the student has demonstrated a high level of competence and initiative.
C1-C3 Good	A good project. There are flaws, but the student has demonstrated competence and initiative.
D1-D3 Adequate	A fair project. There are many flaws but the overall performance is satisfactory.
E1-E3 Weak	A weak project. There are significant flaws, indicating a lack of understanding of the methods used and a weak approach to the project.
F1-F3 Poor	A poor project. There are major problems, but also signs of some work.
G1-G2 Very Poor	A very poor project. There are major problems and very few signs of any constructive work.
H	No significant attempt.

Note that the award of MSc requires an overall band of **at least D3** in the project. Students who achieve E1 or worse in the project do not meet the requirements for MSc and will be awarded the appropriate Postgraduate Diploma instead. Students who achieve an E1 or worse may be able to resubmit.

4. Reconciliation and Arbitration

Each project is first assessed by two examiners, whose overall grade bands may differ. There are protocols in place for agreeing on a final overall grade for the project (discussed below).

In some cases, negotiation and/or arbitration may be necessary. This may involve requesting the supervisor and reader discuss their appraisal of the work and try to reach agreement (negotiation). Alternatively, a third examiner may be asked to assess the project independently, then all three markers will discuss a final grade (arbitration). The Projects Coordinator has absolute discretion to invoke arbitration for any reason, e.g., if two marks fall on either side of a critical borderline, if one of the examiners requests it, if an agreed mark seems unreasonably high or low, or if there are questions of collusion or conflict of interest in marking. In rare cases where arbitration does not resolve disputes, the Projects Coordinator has the ultimate authority to assign a mark.

- If grades differ by 1 secondary band (e.g. [B1,B2]), the supervisor's overall mark is taken as the final mark.
- If grades differ by 2 secondary bands (e.g. [B1,B3]), the middle mark is taken as the final mark (in this case, [B2]).

- If grades differ by 3 or 4 secondary bands (e.g. [B1,C1], [B1,C2]), both examiners must discuss to reconcile their marks and agree on a negotiated final grade. The supervisor must initiate this process.
    - If both examiners agree on a final grade, they must jointly produce written justification for the negotiated award and the supervisor should enter this into the project system to complete the marking process.
    - If both examiners cannot agree on a final grade, the Project Co-ordinator will arrange for arbitration to take place.
- If grades differ by more than 4 grade bands (eg. [B1,C3]) , the Project Co-ordinator will arrange for arbitration to take place.
- If a project receives a reconciled grade below D3, the Project Co-ordinator may ask a third marker to assess it.
- If a project receives a grade of A1 or A2, the Project Co-ordinator may ask a third marker to assess it.

5. Notes

Last updated 09 May 2022. Adapted from JHW and MMG's project guidance documents.

A. Appendix: Professional Conduct Guidance

These questions are intended to help you set and understand expectations for student professional conduct. Some questions may not apply, and you should interpret them as you see fit.

A.1. Meetings

- Did the student attend meetings regularly, and rearrange when required?
- Did the student attend meetings reasonably on time? (by academic standards!)
- Was the student well prepared for meetings?
    - Was a clear status report and agenda provided before the meeting?
    - Was the student prepared with questions to ask?
    - Was the student ready to provide demonstrations, show code, etc (when appropriate)?
- Did the student take notes and/or minutes of the meetings?
    - Or did you often find yourself repeating things?
- Did you get a chance to review minutes taken after the meeting?
- Was the student polite and courteous in meetings?
- Overall, did the student make good use of your time?

A.2. Independence and motivation

- Did the student take initiative in leading the work?
- Were they proactive in doing background research, exploring ideas and bringing their own thoughts to the project?
- Did the student complete the project without requiring step-by-step handholding?
- Did the student take on board suggestions intelligently?
- Did the student record the time they spent working on their project?
    - Did this correspond to reality?
- Did they honestly assess their own progress without attempting to deceive or without offering excuses?
- Did the student consult you when things went wrong?
    - And make good use of advice offered?
- Did the student plan their time effectively?
- Did they make a reasonable attempt to adhere to this timeline, and manage obstacles that came up sensibly?

A.3. Professional behaviour

- Did the student follow applicable procedural guidelines or legal requirements (ethical approval, IP agreements/NDAs, confidentiality, data protection) carefully?
- If the project involved external clients, did the student interact professionally with the clients?
- Were there instances where the student's professional behaviour could have reflected badly on the University, or negatively influenced collaborations you have established/are establishing?
- If the project involved collaboration, was the student active and involved in the collaboration? Or did they disengage or require you to keep things going?

A.4.   Use of tools

- Did the student use appropriate version control?
- Did the student use appropriate tools for development (e.g., didn't edit their source code in WordPad)?
- Did the student use appropriate software to support development, writing and deployment (e.g., build systems, automated experimental analysis, deployment management systems) or was the project held together with hacky solutions?
- Was data stored, transmitted, and managed in a secure way, e.g., with respect to data protection (only where applicable)?

B. Appendix: Complete Marking Grid

	Problem Analysis	Outcome (Research Insight or Software Product)	Reflection	Dissertation
A_1-A_5 Excellent	The problem analysis is excellent. The dissertation shows a comprehensive understanding of context and related work. The approach for addressing the problem is definitely feasible.	The project achieved an excellent outcome and demonstrated an excellent approach in tackling the problem (e.g., leading to excellent technical achievements and/or critical insight).	The analysis is very thorough and there is very clear evidence of critical reflection on findings and the project as a whole. There are excellent suggestions for further work.	The dissertation is complete, very well organised, very clearly written, and highly literate.
B_1-B_3 Very Good	The problem analysis is very good. The dissertation shows a good understanding of context and related work. The approach for addressing the problem is feasible.	The project achieved a very good outcome and demonstrated a very good approach in tackling the problem (e.g., leading to very good technical achievements and/or critical insight).	The analysis is thorough and there is evidence of critical reflection on findings and the project as a whole. There are very good suggestions for further work.	The dissertation is complete, well organised, clearly written, and literate.
C_1-C_3 Good	The problem analysis is good. The dissertation shows a reasonable understanding of context and related work. The approach for addressing the problem is reasonably feasible.	The project achieved a good outcome and demonstrated a good approach in tackling the problem (e.g., leading to good technical achievements and/or critical insight).	The analysis is quite thorough and there is some evidence of critical reflection on findings and the project as a whole. There are some good suggestions for further work.	The dissertation is nearly complete, fairly well organised, mostly clearly written, but occasionally less than literate.
D_1-D_3 Adequate	The problem analysis is adequate. The dissertation shows partial understanding of context and related work. The approach for addressing the problem is just about feasible.	The project achieved an adequate outcome and demonstrated an adequate approach in tackling the problem (e.g., leading to adequate technical achievements and/or critical insight).	The analysis is just adequate and there is some limited evidence of critical reflection on findings and the project as a whole. There are unconvincing suggestions for further work.	The dissertation is partly complete, not very well organised, clearly written in parts, and often less than literate.
E_1-E_3 Weak	The problem analysis is rather confused. The dissertation shows an inadequate understanding of context and related work. The approach for addressing the problem is unconvincing.	The project achieved a weak or partial outcome and demonstrated a weak approach in tackling the problem (e.g., with limited technical achievements and/or critical insight).	The analysis is barely adequate and there is no evidence of critical reflection on findings and the project as a whole. There are weak suggestions for further work.	The dissertation is incomplete, disorganised, mostly unclear and mostly less than literate.
F_1-F_3 Poor	The problem analysis is confused. The dissertation shows a poor understanding of context and related work. The approach for addressing the problem is ill-conceived.	The project achieved a poor outcome and demonstrated a poor approach in tackling the problem (e.g., with very limited technical achievements and/or critical insight).	The analysis is inadequate and there is no evidence of critical reflection on findings and the project as a whole. There are very limited suggestions for further work.	The dissertation is scrappy, disorganised, unclear and less than literate.
G_1-G_2 Very Poor	The problem analysis is very confused. The dissertation shows a very poor understanding of context and related work. The approach for addressing the problem is very ill-conceived.	The project achieved a very poor outcome and demonstrated a very poor approach in tackling the problem (e.g., with no technical achievements and/or critical insight).	The analysis is worthless and there is no reflection. There are worthless or no suggestions for further work.	The dissertation is very scrappy, disorganised, very difficult to follow and less than literate.
H	No significant attempt.	No significant attempt.	No significant attempt.	No significant attempt.