Honours Project Report Assessment 2011[1]

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1. Introduction

The final project mark is out of 100 and 80 of the marks depend on the project report. The project mark represents ⅜ of the entire honours course mark. Students have to gain at least 50% for the project in order to pass honours[2]. The project report mark is initially determined by the supervisor and second reader and possibly a third person. The staff then meet to discuss all the projects after the students' final project presentations in order to moderate the initial marks. That determines the mark to be given to the external examiner for consideration.

2. The Project Report Mark

The following marking scheme will be used to assess all Computer Science Honours project *reports*. Projects that are cross-disciplinary will also be subject to this scheme. In the unlikely event that this marking scheme is inappropriate for a project that fact has to be stated when the project proposal is made. Before the project can proceed a new *ad hoc* scheme must then be agreed by the honours coordinator in consultation with the staff. A deadline is set for such changes and is usually as soon as the projects have started in earnest.

The optional components allow many different types of projects to be accommodated. Some possible suggestions for point allocations are provided in the next section. Components with fixed weights are the same for all projects. Note that these component categories may not necessarily map directly onto chapters in the Project Report, but those reading the report must be able to assess the student's work or contribution in each of the listed categories. The categories (and how they are assessed) are described later in this document.

The mark for the project report is, rather obviously, determined by the report (the only partial exception is the "Overall General Evaluation"); although the supervisor and examiner will view a demonstration of the project that mainly serves to allow a better understanding of the context of the work. If needed a CD can be added to the report to show multi-media output or code and will be treated as an Appendix to the report.

2.1 Summary of Categories

	Category	Min	Max	Evidence
1	Requirement Analysis and Design	0	20	**Project Report Only** (individual work)
2	Theoretical Analysis	0	25	
3	Experiment Design and Execution	0	20	
4	System Development and Implementation	0	15	
5	Results, Findings and Conclusion	10	20	
6	Aim Formulation and Background Work	10	15	
7	Quality of Report Writing and Presentation	10		
8	Adherence to Project Proposal and Quality of Deliverables	10		
9	Overall General Project Evaluation	0	10	**Report** + [3]
Total marks		**80**		

Table 1. Summary of assessment categories indicating maximum and minimum marks that can be chosen. All choices have to add up to 80 in total.

[1] This document may be revised during the year; the date of this revision is at the foot of this page.

[2] For CSC4016W the minimum mark for the project is 40% but an average of 50% overall for honours.

[3] Apart from the project report the additional evidence for this category can include, for example, notes from the demonstration, minutes of meetings as posted on website or a supervisor's report on the project.

2.2 Project Report Categories (80 Marks)

The supervisor(s), in consultation with the student, should select weightings of the variable categories, depending upon two main factors and designed to maximize the potential marks obtained:

a) the general applicability of the category to the work done,
b) the objectives of the project.

Note that *all* projects must assign points to these various categories so that they total exactly 80. Please use the statements in each category as a guide to assessing what a student has earned for each category. For example, under normal circumstances, to award the maximum mark for a category all of the statements corresponding to that mark should be true.

During the course of the project, supervisors should not make promises to students with respect to the marks / classes that they can expect. When the project is in full swing and unlikely to be changed in any major way, the student and supervisor meet to agree on the categories to be used in the assessment. These categories weightings should be entered on the cover sheet of the final project report. The following table provides possible point allocations for three quite different kinds of projects (of course any other combination adding up to 80 is also acceptable).

	Category	**Development**	**Experimental**	**Theoretical**
1	Requirement Analysis and Design	15	0	0
2	Theoretical Analysis	0	0	25
3	Experiment Design and Execution	0	20	0
4	System Development and Implementation	15	10	5
5	Results, Findings and Conclusion	10	20	20
6	Aim Formulation and Background Work	10	10	10
7	Quality of Report Writing and Presentation	10	10	10
8	Adherence to Project Proposal and Quality of Deliverables	10	10	10
9	Overall General Project Evaluation	10	0	0
Total marks		**80**	**80**	**80**

Table 2. Possible assignment of optional categories for a few different types of honours projects

3. Ancillary Project Documents and Deliverables (20 Marks)

Note: these components have their own mark schedules which are not reproduced here.

1. Proposal Presentation 5 points
2. Project Poster 5 points
3. Web Pages 5 points
4. Self reflection 5 points

There are also some deliverables which either form part of the Research Methods Course (the Literature Survey and Project Proposal) and others which have to be done to complete the course:

5. Prototype Demonstration
6. Final Demonstration
7. Final Project Presentation

4. Assessment Categories

In each of the following we list the characteristics of the category, often as questions to be asked of the report, and characterize what constitutes full and partial marks.

4.1 Requirement Analysis and Design

This category deals with the strategy adopted in analysing and designing a computational artefact according to Software Engineering *or* Design practice. The artefact is usually a prototype of a software product but it can also be a testbed of an experimental system. Requirements for evaluation:

1. The system design has to be justified in terms of the expected behaviour of the final product.

2. The design process should be structured so that a well-structured, modular, robust system results.
3. The project should employ concepts and techniques appropriate to modern computer science.

Please note that "design" as used below stands for "Software Engineering and/or Design".

0-39%	Little or no evidence of any design whatsoever.
40-49%	No evidence that the design process is understood.
50-59%	Design carried out in a way that makes sense, but process has many flaws. It is readily apparent that the programming project analysis was not written by a first year.
60-69%	Logical design process followed, but design decisions mostly not justified. Used relevant design tools/techniques.
70-74%	Clear understanding of the design process shown. Proceeded in a logical manner and justified most decisions. Used proper design tools/techniques in a rigorous and intelligent manner.
75-84%	Clear understanding of the design process shown. Proceeded in a logical manner and justified all decisions. Fluent use of design tools/techniques. Design shows originality and ingenuity in approach.
85%+	Very clear understanding of the design process shown. Proceeded in a logical manner, considering all options and fully justifying all decisions. Showed understanding of the purpose of design tools/techniques in their use. Design shows considerable originality and ingenuity in approach.

4.2 Theoretical Analysis

This category is to evaluate the theoretical analysis for those projects which requiring it:

- *either*, theory of computation (for example, proofs, algorithm analysis and derivation of computational complexity).
- *or*, where the background theory needs to be adapted to deal with the problem being addressed and a theoretical understanding of computational aspects of an application area has to be developed (for example, theory in this sense includes how a specialized CODEC for the application would work, and so on).

Questions to ask include:

1. How sound is the analysis? Is it correct, are the assumptions valid?
2. What is the relative complexity? Is it appropriate for a 4^{th} year project?
3. Is it well presented/accessible?

0-39%	Little or no understanding demonstrated.
40-49%	Shows little understanding, and cannot relate any of the work to underpinning theory.
50-59%	Shows understanding of some aspects, at a fairly superficial depth. Unable to present theoretical basis for work, though has identified some relation between the work and underpinning theory.
60-69%	Shows understanding of what has been done. Theory applied but report fails to demonstrate understanding of theory.
70-74%	Good understanding of what has been done, and has described theoretical basis, albeit with understanding of theory limited to that used directly.
75-84%	Thorough understanding of the subject and has applied this understanding to the solution of unfamiliar problems or application area.

85-95%	Deep and comprehensive understanding of the subject. Applied understanding to the solution of unfamiliar and difficult problems or reinterpreting theory to apply in a different problem domain
95%+	The student has evident mastery of difficult material, has explained it fluently, and has demonstrated significant original thought.

4.3 Experiment Design and Execution

This category is intended for those projects which use experimental or field testing methods: either quantitative or qualitative. Note that results and their analysis are evaluated in Section 4.5, not here.

The table of criteria below are orientated towards quantitative methods. Where a qualitative investigation is required the grading requirements should be adjusted appropriately. Since qualitative research comes in many different forms it is not possible to include them in this summary. Supervisors must clarify the evaluation criteria of the particular method of qualitative research adopted with both the student and the second reader at the start of the project.

Questions to ask of qualitative work:

1. Is there an important and well formulated question?
2. Was the researcher's perspective taken into account?
3. What were the quality control measures on the data collection and analysis?
4. Is the research methodology sound?
5. Is there enough depth and evidence to be credible and induce trust?
6. Is there evidence of triangulation of research?

Questions to ask of quantitative work:

1. Is there a well formulated hypothesis?
2. Were the experiments designed to confirm/refute the hypothesis (i.e. are they appropriate)?
3. Is the research methodology sound?
4. Can the experimental testbed be systematically modified to check the effects predicted by the hypothesis?
5. Is the work reported in such a way that the results can be replicated?

0-29%	Little or no evidence of any experiments (where experiments were required).
39-40%	No evidence of any design of experiments. Almost no data from experiments.
40%-49%	Some evidence of experiment design. Some data collected but of very little use.
50-59%	Some appropriate experiments carried out, but with very poor results. Almost no attempt to analyse the results.
60-69%	Evidence of experimental design. Some success with experiments, but reliability uncertain and little attempt to account for errors. Problems, that could have been solved, not overcome. Appropriate ethical clearance obtained
70-74%	Work properly planned, carried out carefully and fully documented. Method reliability discussed adequately. New techniques applied. Problems overcome by developing equipment or method. Ethical issues discussed and clearance obtained if needed.
75-84%	Experiments designed and either piloted or replicated. Theory developed and applied. Experiment method compared with theory and deviations examined and explained. Ethical issues discussed and clearance obtained if needed.
85%+	As above: experiments very carefully designed, and ingenuity demonstrated in this design. Every reasonable step has been taken to produce reliable results.

4.4 System Development and Implementation

This category is intended for those projects where actual system creation plays an important role. Questions to be addressed are:

1. How the design was implemented. For example, was a good language chosen to do the project in? Are the algorithms chosen the best ones available?
2. Are the data structures which have been selected appropriate for the objects and stores which were identified during analysis?

0-39%	▪ Little or no functioning software has been produced. No documentation.
40-49%	▪ Some code produced and it does do something but does not work properly and there is very poor documentation ▪ No evidence of any thought given to a proper implementation process.
50-59%	▪ Code basically working but poorly documented, ▪ System not particularly reliable ▪ Has not followed a proper implementation process based on design. ▪ Student shows little knowledge of standard algorithms and appropriate data structures. ▪ User interface difficult to understand and use.
60-69%	▪ Working code produced and documented. ▪ It does most of what it is supposed to do most of the time. ▪ Some evidence of a proper implementation process. ▪ Standard algorithms and data structures employed, although they might not be optimal for the task at hand. ▪ User interface can be used with just a little guidance from the student.
70-74%	▪ Working code produced and thoroughly documented. ▪ It meets most specifications reliably. ▪ The programming techniques used are highly professional, particularly in terms of structure and testing. ▪ Correct and efficient algorithms and data structures used. ▪ A proper implementation process has been clearly followed and documented. ▪ User interface usable without help from the student.
75-84%	▪ Working code produced and thoroughly documented. ▪ It meets all specs reliably. Fully documented. ▪ The programming techniques used are highly professional and issues of maintainability, portability etc. were addressed. ▪ The student exhibits an excellent knowledge of the computer language concerned. ▪ User interface user friendly.
85-94%	▪ A good example of software engineering carried out properly. ▪ A rigorous implementation process has been followed in writing of an impressive piece of software ▪ That is robust and reliable and fully meets or exceeds demanding specifications. ▪ Full documentation, issues of maintainability, portability etc. fully addressed and ▪ The user interface is very clear and easy to use.
95%+	▪ As above and work is original and / or ingenious and shows imaginative invention.

4.5 Results, Findings and Conclusion

This section is meant to apply equally to development projects, research projects and theoretical projects. It is about the extent to which the results of the project were analysed and related to the aims. Questions to ask:

1. Was an evaluation of the output attempted against the stated aims (or research questions, as appropriate)? For theoretical work, this equates to a satisfactory proof mechanism. Experimental systems will usually have statistical verification and analysis.

2. Did the work evaluate the correct questions? Were the conclusions drawn appropriate/reasonable?
3. Are the results / findings / conclusions presented clearly?
4. Are the results / findings discussed in a mature manner, worthy of honours level study? If the results are contrary to expectations is there an explanation of why this is so?
5. Is insight in the interpretation of the results clearly shown? Are there gaps, or obvious oversights? Was the evaluation technique used appropriate for the problem?

0-39%	Little or no evidence, results and no conclusion.
40-49%	Some very poor results presented but no attempt to analyse them/draw any conclusions.
50-59%	Some poor results. Almost no attempt to analyse the results. No attempt to relate conclusions to project aims.
60-69%	Some results, but reliability uncertain and little attempt to analyse them. Conclusions drawn.
70-74%	Results fully documented and reliability or unreliability discussed adequately, some use of statics. Importance of results discussed. Conclusions supported by results and related to project aims.
75-84%	Experiments replicated and errors estimated (statistically where possible). Results fully documented and examined for reliability. Importance discussed and significance pointed out. Conclusions supported by results and related to project aims and research questions. Contributions highlighted, future extensions sketched.
85-95%	As above: Every reasonable step has been taken to verify the results, and a thorough error analysis has been completed. Discussion of results is comprehensive and convincing with interesting implications pointed out. Conclusion shows to what extent aims were realized and is frank about possible shortcomings. Novel insights pointed out, future valid extensions sketched.
95%+	Results may be publishable.

4.6 Aim Formulation and Background Work

The research question or system requirements must be clearly stated in the introduction and placed in a context that shows the importance of the project. The reader should gain a sufficient understanding of what the student proposes in order to follow their arguments and understand their work.

Although the students have already handed in a literature survey, that is regarded as a first draft of the background chapter and it should be evaluated here as a component of the whole project report.

1. Is the research question well motivated or justified?
2. Does the student shows an appreciation for the importance of their project in the overall context of Computer science?
3. Was the background research thoroughly done? Was a classification of the surveyed work attempted?

0-39%	Little or no evidence of any research whatsoever, neither proposed nor done.
40-49%	One or two sources (probably books or wikipedia) read. Vague statement of problem area.
50-59%	Several sources of information used, but research naïve and not systematic. Aims stated in general terms. Some major gaps in the background research.
60-69%	Systematic literature survey attempted, but incomplete or inconsistent. Aims clearly stated. Ethical, professional and Intellectual Property issues raised as appropriate.

70-74%	Competent literature survey carried out, that is, all important material has been covered. Aims well formulated and testable (falsifiable). Ethical, professional and Intellectual Property issues discussed as appropriate.
75-84%	Comprehensive literature survey, sound base for project and further work. Aims clearly stated, and for a research project stated as research questions. Ethical, professional and Intellectual Property issues investigated and addressed as appropriate.
85%-95%	Literature survey very systematic and comprehensive (including all key papers). Importance of project aims clear and for a research project the aims are presented as testable hypotheses. Ethical, professional and Intellectual Property issues investigated and comprehensively addressed, as appropriate.
95%+	As above. Student produced a classification of work in the field.

4.7 Quality of Report Writing and Presentation

Among the elements that should be considered when arriving at a mark:

1. the succinctness and clarity of whole work and especially the abstract;
2. the clarity with which the student introduced their project and explained their objectives;
3. the presentation of their arguments/rationale for pursuing their particular solution;
4. the conclusion is well structured: it revisits the issues they addressed and recaps their major results/contribution
5. the use of sufficient and correct references in an appropriate style (ACM for example).

0-39%	Little or nothing handed in which could be accepted as representing a report. The writing is so poor that the document is almost incomprehensible.
40-49%	Quality is low, with little or no structure. Reads like an expanded poor second-year project report.
50-59%	Required components present in recognisable form. Possible to see what has been done from the report. Flawed, but has some results, some explanations and description of work which indicates that, with some additional application something worthwhile could be produced.
60-69%	The report is properly structured and the required components are properly presented, but there are significant flaws. E.g.: references, diagrams, and calculations show errors or omissions.
70-74%	The layout of the report follows the guidance given. It is easy to read with few grammatical or spelling mistakes and gives a clear account of the project.
75-84%	The report is coherent, follows the guidance given strictly, well structured, easy to read, and few corrections are required. It gives a very clear account of the work that has been done and sets this in the context of other work.
85-94%	The report is excellent in every way. It needs no corrections, or only a few very minor corrections.
95%+	As above and the writing is of publishable quality.

4.8 Adherence to Project Proposal and Quality of Deliverables

The project plan will have been assessed in the Project Proposal. Here we consider the evidence presented in the Project Report and we wish to establish whether the project achieved the required outcomes and met the proposed success factors. If everything was not achieved, what justification is there for deviating? This section also tries to answer the question: What is the quality of the deliverables as evidenced in the report? The deliverables can be concrete (e.g., software) or a theoretical result (new proof, useful extension of theory etc).

1. Does the outcome adhere to the Project Proposal originally presented?
2. If there are differences, are these suitably justified?
3. Did the project end up carrying out the proposed project plan? If not, is this justified? Were there problems with equipment/resources?

4. Was there an attempt to uncover underlying causes of difficulties? (e.g., unanticipated risks, lack of documentation inherent in the use of open source, etc.)
5. Does the product/solution work well?
6. Does it demonstrate or achieve what it set out to do, according to the proposal's success factors?

0-39%	▪ Almost nothing to show for any work that has been put in. ▪ No evidence of planning. ▪ No deliverables: little or nothing recognisable has been made.
40-49%	▪ Aims not met. ▪ No evidence of following planning procedures. Amount of work insufficient. ▪ The deliverable may be recognisable but it doesn't work.
50-59%	▪ Progress towards meeting many aims. ▪ Met some deliverables and gave some indication of deviations. ▪ The deliverable is unlikely to work very well. ▪ Student produced most, but not all, of the project's planned outcomes.
60-69%	▪ Aims mostly met. ▪ Delivered according to plan and indicated where and why deviations were made. ▪ The deliverable works satisfactorily.
70-74%	▪ Reasonably ambitious aims met fully or less ambitious aims exceeded. ▪ Evidence of difficulties anticipated and planned for. ▪ Tests were reported that showed that the deliverable works well.
75-84%	▪ Clear evidence of problems anticipated and dealt with in a way that was coherent with overall objectives. ▪ Ambitious aims / success factors met fully or reasonably ambitious aims exceeded. ▪ Tests were reported that convincingly showed that the deliverable works well/perfectly and shows real care and craftsmanship.
85-94%	▪ As above and the tests show the deliverable works perfectly / beyond expectation and the report shows that it demonstrates state of the art techniques. ▪ A member of staff could be proud of this work.
95%+	▪ As above and the product/solution design extends existing design knowledge (or complex proof only understood by one other person and perhaps by supervisor :-).

4.9 Overall General Project Evaluation

Note that evaluation will mean different things for different kinds of projects. These points are therefore suitably non-specific. This is the one case where marker can go beyond the report itself and try to evaluate the project as a whole. This has to be based on *concrete and reproducible evidence* such as notes on demonstrations, minutes of meetings recorded by the students or a supervisor's report on the project supported by a written record of a critical interview of the supervisor by the second reader.

0-39%	Failure: Likely that the student has effectively dropped out of honours.
40-49%	Unsatisfactory. No evidence of any real progress nor of following initial plans. Nothing worthwhile produced, although evidence of some work, albeit unsuccessful. Supervisor has given clear guidance but student has failed to follow it.
50-59%	Satisfactory. Project planning attempted. No evidence of independent thought or much initiative. Could readily be completed by any student. Student needed very clear guidance from supervisor, and has taken advantage of most, but not all, of this guidance. Generally not worked as hard as required.
60-69%	Good. Mostly met project milestones and kept project plan up to date. A competent technician could have done most of the work. Evident that fairly regular contact was maintained with supervisor. Student worked hard and good progress was made.
70-74%	Very good. Regularly met milestones and tracked progress against project plan. Demonstrated ability to manage own work. Project required both ability and application to

	complete. Regular contact with supervisor, needed some advice, and worked hard.
75-84%	Excellent. Creatively managed project planning and risk assessment. Only a few students could have completed. Contains "something extra". Meetings with the supervisor productive. Worked consistently and appropriately, almost totally self-motivating and self-managing.
85-95%	Outstanding. No student could reasonably be expected to achieve much more or present it better with the time and resources available. In top 5% of projects. Meetings with the supervisor very productive and involved a two-way exchange of ideas. The work could be presented at a conference / easily extended to an MSc.
95%+	As above but candidate for best project.

5. Project Failure

It is sometimes instructive to define success in terms of what should be avoided. Note that overall project failure (which includes the marks for the additional components that do not depend on the report itself) is equivalent to failing honours. Here is a definition of failure:

A failure means that at least three of the following are true:

- The student is incompetent / never really knows what comes next / is lost.
- The work is not presentable anywhere (including in private!) and / or is an embarrassment.
- The work achieves nothing at all.
- There were significant mistakes in the final implementation of the work and the student could not / did not correct them or never realised they were there!
- The student has very little knowledge of the literature in the area of the research.
- The student cannot self-start and needs constant prodding.
- The student is unwilling and unable to devise plans of action on his / her own initiative.

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