



澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University

Faculty of Applied Sciences
Bachelor of Science in Computing

Instruction Handbook
for
COMP490 Final Year Project

Academic Year 2024/2025

Version 1.3.2

Last update: 2024-08-20

Table of Contents

1	Overview	3
1.1	Project Allocation.....	3
1.2	Student's Responsibilities	3
1.3	Supervisor's Responsibilities.....	3
1.4	Assessor's and Presentation Panel's Responsibilities.....	4
2	Project Work.....	5
2.1	Project Implementation	5
2.2	Project Management.....	5
2.2.1	Project Proposal and Ethics Checklist.....	5
2.2.2	Monthly Status Review	6
2.2.3	Work Book.....	6
2.3	Progress Report and Presentation	6
2.4	Final Report.....	6
2.5	Final Presentation	7
2.5.1	Oral Presentation.....	7
2.5.2	Poster Session.....	8
2.6	Schedule.....	8
3	Assessment.....	10
3.1	Marking Criteria and Markers	10
3.2	Marking Consistency	11
3.2.1	Deviation of Marks	11
3.2.2	Marks Perusal and Approval.....	12
3.3	Plagiarism	12
3.4	Implication of Project Failure	12
4	Concluding remarks.....	13
	Appendix A. Overview of Progress Report Content.....	14

Appendix B. Overview of Final Report Content 16

Appendix C. Marking Criteria 18

1 Overview

The final year project (FYP) aims to allow students to tackle a real problem and to complete the specification / design / implementation / documentation / testing / evaluation processes. Students are required to develop software projects and / or carry out research project in areas relevant to your degree programme. The FYP is an individual yearly project. Students are required to explore an area of information technologies in considerable depth, demonstrating sound problem solving and analytical skills.

1.1 Project Allocation

Students may propose their own project topics, or choose from a list of topics provided by the project supervisor team, available before the start of the first semester. A panel from the supervisor team will approve both types of proposed project titles. Approval of a proposed topic depends on how well the topic can be developed to reach a satisfactory level. In addition to a basic first come first serve scheme, the supervisors should consider the suitability of a student in taking up a demanding topic. Each student is assigned one supervisor, one assessor and a presentation panel. Usually, the assessor will be one of the presentation panel members. The supervisor, the assessor and the presentation panel will grade the project, but with different weighting.

1.2 Student's Responsibilities

The responsibilities of the student may be summarized as follows:

- To define the project objectives and the possible outcomes;
- To monitor their project progress;
- To maintain regular contact and arrange appointments with the supervisor;
- To pick up the needed knowledge, and deal with implementation details;
- To formulate specific problems before asking the supervisor;
- To be self-motivated;
- To report immediately to the supervisor any equipment failure and other difficulties that would interrupt their work.

1.3 Supervisor's Responsibilities

The supervisor's responsibilities may be summarized as follows:

- To provide a list of project titles for selection
- To provide advice and guidance to the student on the project.
- To explain what resources (hardware and software) are available to the students.
- To explain the project assessment method to the students.
- To be available to the student for consultation.
- To evaluate the student's project in terms of quality and quantity.

1.4 Assessor's and Presentation Panel's Responsibilities

The assessor's responsibilities may be summarized as follows:

- To assess students' progress report and final report. [Assessor]
- To assess students' presentations and poster session. [Presentation Panel]

The presentation panel consists of the Assessor and one other member of the supervisor team.

2 Project Work

You (the student) have to undertake a series of tasks in this final year project module in order to reach a satisfactory conclusion.

2.1 Project Implementation

There are two broad categories of projects in FYP. The first is system development project. Students are required to formulate their problem, study the needs of different stakeholders, design an effective solution using suitable technologies and tools, and verify the system quality. The second is research-oriented project, in which students participate in research work under the supervisor's guide. The exact tasks to be completed vary from project to project, but typically include experiment design and analysis of findings. To finish the project on time, students are advised to prepare their own schedules to monitor their progress.

2.2 Project Management

You are required to carry out correct project management. This includes proper planning using tools outlined in the Final Report template. Your supervisor will use these documents to check your progress and evaluate your project management skills. Detailed requirements are described below.

2.2.1 *Project Proposal and Ethics Checklist*

By the end of Week 3 of the first semester, you **MUST** submit a **Project Proposal**. This document defines the scope of your project by setting the objectives and expected outcome. It also explains the relevance of the project, highlights major challenges, and describes potential risks and their mitigation. In addition, it includes a tentative schedule for the main tasks in the project. The Project Proposal should follow the standard format in the official Project Proposal template.

In addition, you should fill in an **Ethics Checklist** Form and submit together with the proposal, and the FYP panel will review the form. If potential ethics issues are identified, you should follow through in the progress of the project, and report the work that you have fulfilled in the Final Report. You must perform suitable identification and mitigation of potential ethical issues in order to pass.

2.2.2 *Monthly Status Review*

To reflect on the project progress and facilitate active project management, you are required to perform project status review by the end of each month. You have to briefly report what tasks you have accomplished and your plan for the coming month in the report. This helps your supervisor to monitor your progress. The monthly status review is submitted as a section in the Progress Report and Final Report.

2.2.3 *Work Book*

In addition, it is recommended that you keep a project **Work Book** to record important discussions with supervisors, consideration and decision processes within project design and implementation, difficulties encountered and solution / work-around taken. This information is critical when you write your project report, since the process is as important as the result in this yearly project, and you must describe your development methods in the Final Report.

2.3 **Progress Report and Presentation**

At the end of the first semester, you are required hand in a Progress Report and give a Progress Presentation.

The **Progress Report** is an important milestone in the yearly project. It consolidates your accomplishment in the first half of the project, and lays out the plan to complete the project in the second half. Moreover, your supervisor can give early feedback to formatting and writing style in the report. The Progress Report should conform to the official FYP Progress Report template. Refer to Appendix A for an overview of the content of the Progress Report.

During the **Progress Presentation**, you are required to showcase your work through a slideshow to the presentation panel. This presentation serves two main purposes: first, it provides you with valuable presentation experience that will be beneficial for your final presentation or poster session in the second semester. Second, it offers an opportunity to receive early feedback on your presentation skills. Please note that absence from the progress report without a valid reason will result in a minimum 50% deduction from your motivation mark (S1), which will be awarded at the end of the second semester.

2.4 **Final Report**

The **Final Report** is the main deliverable of the yearly project that you **MUST** submit at the end

of the second semester. **IMPORTANT:** the Final Report is the main evidence of your project work, and the supervisor and assessor will do most of the marking (specifically marking criteria R1 – R5) by assessing the Final Report.

Appendix B provides an overview of the content of the Final Report. Typically, it defines the project problem in context of related works, provides details of the methods used to solve the problem / develop a solution, describes the project outcome in detail, gives evidence that it achieves the objectives / solves the problem, and discusses its significance. The Final Report should conform to the official FYP Final Report template.

The precise content of your final report will depend on the nature of the project. For example, a system development project may require extensive explanation of the user interface, and screen captures, whereas a research-oriented project may present the methodology and performance evaluation. What should be included in the report should be discussed between you and your supervisor.

Before the submission of the finalized version of the report, in the Week 8 in the second semester, you have to submit a draft of the Final Report to your supervisor. This draft should have complete content in Chapter 1 and 2. You should also finish at least half of Chapters 3 and 4. (Usually, either the design and implementation, or the results and discussion.) For incomplete chapters, there must be at least a writing plan that delineates the content to be included in the final version. In other words, this draft report should provide a clear picture of overall structure and logic flow of the Final Report.

The supervisor will comment on the overall structure of the draft report and, if necessary, suggest missing information in the report. Fixing the overall structure early is also important because you have to complete and submit the poster in Week 10.

2.5 Final Presentation

At the end of the second semester, you have to present your work in two activities, namely oral presentation and poster session.

2.5.1 Oral Presentation

Oral presentations are considered an important part of the final year project assessment. A good presentation does not only require proficiency in spoken English but also the ability to transfer information in a manner that is interesting, informative and accurate.

In the oral presentation, you have to present your work in this yearly project with a slide show to the presentation panel. You **MUST** present and discuss the major results in this project. Note that the oral presentation is compulsory, and you must obtain a passing mark in the presentation in order to pass the FYP module. One purpose of oral presentation is to verify whether the project work is done by you. In the Q/A session, you will need to answer questions within a time limit. You may fail the module if you cannot show that you understand the details of your project.

During the final presentation, you are advised to play a pre-recorded video for project demonstration. You may choose to demonstrate your project before the final presentation. The purpose of the project demonstration is to provide you with the chance to present a live demonstration to your supervisor and assessor, so that the work can be better evaluated. You may discuss with your supervisor and assessor on the arrangement of the demonstration.

2.5.2 Poster Session

In the poster session, you have to present your work in a poster and hold discussions with attendees who are interested in your project. Second year and third year students and other teachers from the Computing Program are invited to participate in the poster session. You are required to attend this event to answer any questions that the poster might raise.

2.6 Schedule

The general schedule of FYP activities and deadlines is shown in Table 1. The exact date of the deadlines will be published in the module Canvas page.

Table 1 Project Schedule

Week	Event
<i>Semester 1</i>	
1	Project allocation
3	Project Proposal and ethics form submission
4	Supervisors return comments on Proposal
4–14	Regular meetings with supervisor. Monthly status review
5	Finish project planning, and write chapter 3 in Progress Report
12	Progress Report submission
13	Progress Presentation
15	Supervisors and assessors return comments on Progress Report
<i>Semester 2</i>	
1–13	Regular meetings with supervisor. Monthly status review
6	Implementation mostly done. Focus on report writing hereafter.
8	Final Report draft submission to supervisor
9	Supervisors return comments on Final Report draft
10	Poster submission
13	Final Presentation, Poster session Final Report submission

3 Assessment

Marking of the project is done in two parts: at the end of 1st semester, and the end of 2nd semester.

3.1 Marking Criteria and Markers

Each project is graded by a supervisor, an assessor and a presentation panel, based on the criteria detailed in Appendix C. Students are strongly recommended to read through the details of the marking criteria carefully.

Two markers, namely the supervisor and the assessor, will mark the progress report and final report. In the 1st semester, the supervisor and the assessor mark the progress report using criterion R0. In the 2nd semester, the supervisor and the assessor mark the final report using criteria R1-R5. The two reports contribute a total of 72% to the final mark.

The supervisor performs continuous assessment of the student using criteria S1 and S2. This constitutes 16% of the final mark. The presentation panel evaluates the progress and final presentation using criteria P1 and P2. The two presentations contribute a total of 12% to the final mark.

Table 2 summarizes the various components of the final mark. The table details different marking criteria, their markers and their weights.

Table 2 Composition of Final Mark

	Semester 1 [total=14%]			Semester 2 [total=86%]								
Marking criteria	R0	P1	P2	S1	S2	R1	R2	R3	R4	R5	P1	P2
Supervisor [total=52%]	5			10	6	4	4	10	10	3		
Assessor [total=36%]	5					4	4	10	10	3		
Presentation panel [total=12%]		2	2								4	4

A brief description of the marking criteria is provided in Table 3.

Table 3 Summary of Marking Criteria

Criteria	Description	Graded based on ...
S1	Motivation, self-study, independent work	Maintain regular contact with supervisor. Final Report Appendix B.
S2	Project management practice	Proposal, Chap 5 of Final Report
R0	Mid-year Progress	Progress Report
R1	Problem formulation, background research	Chap 1 of Final Report
R2	Related works	Chap 2 of Final Report
R3	Methodology: Analysis of problem and methodical design of solution	Chap 3 of Final Report
R4	Outcome: Results and critical evaluation	Chap 4 of Final Report
R5	Writing skills: clear expression of ideas and arguments	Final Report
P1	Presentation content	Presentation slides, poster, demo setup
P2	Communication skills: Oral presentation and answering questions	Progress presentation, Final presentation, and poster session

3.2 Marking Consistency

The supervisor team (team of all FYP supervisors) strives for consistency of marking via two mechanisms. First, the panel checks for deviation of marks between supervisors and assessors. Second, the final reports and the marks are made available to all supervisor team members for perusal. Afterwards, a meeting of all supervisor team members approves the final marks.

3.2.1 Deviation of Marks

After the supervisors and assessors submit the marks of the Final Report and Final Presentation, the panel will inspect the submitted marking sheets for integrity. The panel will also compare the marks from the supervisors and the assessors for any deviation. The overall marks (in a 100 marks scale) for the final report from supervisor and assessor are calculated from criteria R1-R5. Deviation is defined as more than 10 marks difference between the two marks.

When divergence occurs, the panel will assign a third person to be a moderator. The moderator will mark the final report using criteria R1-R5. Finally, the average of the supervisor mark, assessor mark and the moderator mark is used as the moderated mark for final report in 2nd semester. If the moderator mark has a deviation of more than 10 marks from both the supervisor mark and the assessor mark, the panel will examine the case and make a decision.

3.2.2 Marks Perusal and Approval

After moderation, the FYP panel will make all final reports and tentative marks of this cohort available for perusal from the supervisor team. In case some member of the supervisor team disagrees with marks of a project, the supervisor and/or assessor have to provide justification. The final marks of the cohort will then be approved by the FYP panel. This aims to ensure equity of marking across the whole cohort.

3.3 Plagiarism

According to the Merriam-Webster Online Dictionary, to "plagiarize" means

- to steal and pass off (the ideas or words of another) as one's own
- to use (another's production) without crediting the source
- to commit literary theft
- to present as new and original an idea or product derived from an existing source.

In other words, plagiarism is an act of fraud. It involves both stealing someone else's work and lying about it afterward. [<https://www.plagiarism.org/article/what-is-plagiarism>] For more details about plagiarism and how to prevent it, please refer to www.plagiarism.org.

Please note that any alleged cases of academic dishonesty¹, including plagiarism, will be reported to the Faculty Dean who shall conduct a thorough investigation. Established cases should be reported to the Pedagogic Committee for further consideration. Any proven acts of academic dishonesty may result in dismissal from the University.

A zero mark will be given if you copy someone else's work or you let someone copy your work.

3.4 Implication of Project Failure

If you fail the individual project module, you have to retake it in another academic year. Since the project module is offered in year 4, failing the module will delay the award of the degree.

¹ see https://www.mpu.edu.mo/teaching_learning/en/cheating_exam.php

4 Concluding remarks

Please be reminded of a few important points that previous FYP students often forgot:

- Your work is largely graded based on your Final Report. Include sufficient detail in the report so that the markers can fully understand what you have accomplished in this project and how you accomplished them.
- Spare enough time to prepare the report. Start early. Do not postpone report writing towards the end of the project.
- Final presentation is REQUIRED for passing the FYP module.

Appendix A. Overview of Progress Report Content

The Progress Report is an important milestone in the yearly project. It consolidates your accomplishment in the first half of the project, and lays out the plan to complete the project in the second half. Moreover, much of the content in the Progress Report will be reused in the Final Report. The main body of the Progress Report consists of five chapters and references. The following lists some important content you should include in these chapters.

- Chapter 1. Introduction
 - Define the project with clear SMART objectives.
 - Establish the relevancy of the problem, and put it in the context of related works.
 - Identify societal, user, business and customer needs as appropriate.
 - Ethical Consideration
- Chapter 2. Background and Related Works
 - Provide sufficient background knowledge that helps readers not familiar with the problem domain.
 - May provide more detail of related works and the literature.
- Chapter 3. Project Management and Risk Management
 - Break down your project into a list of activity list and apply the Precedence Diagramming Method and a Gantt chart to arrange a project schedule.
 - Show effective project planning for the 2nd semester
 - Exhibit clear idea of what to do to complete the project
 - Identify the major risks and their mitigation
 - Monthly status review
- Chapter 4. Completed work
 - Describe what you have accomplished in the 1st semester
 - *Include only original, creative content.* (Long description of others' work should be moved to Chapter 2)
 - Provide detailed analysis of the problem, and if possible, a high-level design of the system
 - Highlight difficulties encountered, alternatives evaluated and solutions adopted. The design process is as important as the decisions themselves!
- Chapter 5. Conclusion
 - Reflect on the progress of the project. Can use first person to write.

- References
 - List references to background information and related works
- Appendix A. Ethics Checklist

In addition, the Progress Report should be based on the standard template file to observe the formatting requirements. You should also update the front matter (pages before the main body), listed below.

- Cover page: fill in correct project title, project number, student and supervisor info
- Declaration of originality: add your signature
- Abstract: summary of your progress report.
- Table of Contents
- Table of Figures
- List of Tables

Appendix B. Overview of Final Report Content

The Final Report is the main deliverable of the yearly project. It defines the project problem in context of related works, provides details of the methods used to solve the problem / develop a solution, describes the project outcome in detail, gives evidence that it achieves the objectives / solves the problem, and discusses its significance. The main body of the Final Report consists of six chapters and references. The report also has two required appendices. The following indicates key content in each chapter / appendix.

- Chapter 1. Introduction
 - Define the project with clear SMART objectives.
 - Establish the relevancy of the problem, and put it in the context of related works.
 - Identify societal, user, business and customer needs as appropriate.
 - Ethical Consideration
- Chapter 2. Background and Related Works
 - Provide sufficient background knowledge that helps readers not familiar with the problem domain
 - May provide more detail of related works and the literature
- Chapter 3. System Design / Methodology
 - Provides high-level description of the methods to solve the problem, and include low-level detail where appropriate.
 - Provide sufficient information on how the project is accomplished. There should be enough detail for others to replicate your work.
 - Perform detailed analysis of problem and methodical design.
 - Exhibit analytical thinking. Provide arguments why you believe your approach should work. Compare alternatives in design and justify decision.
 - Highlight difficulties encountered, alternatives evaluated and solutions adopted. The design process is as important as the decisions themselves!
- Chapter 4. Results and Discussion
 - Describe in detail the outcome (including software, hardware, system, experiment results, etc.)
 - Use screen shots to illustrate how software interacts with users. Include testing to ensure that the implementation is working properly.
 - Experiment projects usually have statistical verification and analysis, presented in suitable charts and figures. Add insightful analysis to explain your experimental result.
 - Discuss significance of the outcome and highlight your contributions.

- Evaluate the societal and environmental impact of your solution throughout its life-cycle.
- Identify security vulnerabilities and implement suitable mitigation measures throughout the developed system
- Discuss whether or not the project outcome meets the project objectives. Provide evidence to defend your answer.
- Chapter 5. Project Management and Risk Management
 - Break down your project into a list of activity list and apply the Precedence Diagramming Method and a Gantt chart to arrange a project schedule.
 - Identify the major risks and their mitigation
 - Monthly status review
- Chapter 6. Conclusions and Further Work
 - Summarize the main contributions of your work, and how it fulfilled the objectives
 - Describe how your work may contribute to existing works in the field
 - Point out ways to extend your work, or how to overcome limitation of your work
- References
 - List references to background information and related works
- Appendix A. Ethics Checklist
- Appendix B. Reflection
 - Reflect on the progress of the whole project, your approach to addressing the challenges met, and how things might have been improved given the benefit of the experience that you have now gained. You can write in first person.

In addition, the Final Report should be based on the standard template file to observe the formatting requirements. You should also update the front matter (pages before the main body), listed below.

- Cover page: fill in correct project title, project number, student and supervisor info
- Declaration of originality: add signature
- Abstract
- Acknowledgement
- Table of Contents
- Table of Figures
- List of Tables

Appendix C. Marking Criteria

Note: the mark ranges correspond to letter grade in Macao Polytechnic University. For example, 88-100 mark maps to A- or A; 73-87 mark maps to B-, B or B+.

S1. Self-motivation and self-study

- (0-34) The student is unresponsive to supervisor and out-of-contact most of the time. Apply previously taught technique incorrectly.
- (35-49) The student is often unresponsive to supervisor, and replies too much on supervisor's push. Apply previously taught technique incorrectly.
- (50-57) Responsive to supervisor usually, but relies on supervisor's push to work in some cases. Acceptable attendance of meetings with preparation. Minimal self-study, but apply previously taught technique correctly.
- (58-72) Responsive to supervisor, but needs reminder sometimes. Attended most scheduled meetings, but sometimes lack sufficient preparation. Superficial usage of new concepts / technique, with basic understanding.
- (73-87) Self-motivated. Attended most scheduled meetings with preparation. Self-study of new concepts / technique, with good understanding.
- (88-100) Highly self-motivated. Attended all scheduled meetings with preparation. Self-study of new concepts / technique and solve technical difficulties.

S2. Project management and risk management

- (0-34) Little effort on project management and risk management.
- (35-49) Some evidence in project management and risk management, but fails to reach the barely acceptable standard.
- (50-57) Slow and unsteady progress with basic project outcome. Sketchy record of progress. Basic project management. Some considerations to evaluate and mitigate risks associated with the project.
- (58-72) Slow but steady progress with basic project outcome. Adequate project management and risk management supported by suitable documents.
- (73-87) Good progress with good record keeping. Minor problems in project management. Reasonable project management documents and coverage of risk management process to identify, evaluate and mitigate risks associated with the project.
- (88-100) Steady progress with good record keeping. Show evidence of good use of project management. Formal risk management techniques are applied.

R0. Mid-year Progress (Progress Report and Presentation)

In the following, the term “interim product” refers to something contributes in a substantial way towards the system development, experiment, or mathematical development that the student sets out to design and produce in the project.

- (0-34) There is some sort of detectable progress, but nowhere near enough to suggest that the student is likely to be able to complete a final year project.
- (35-49) Some sort of progress has been made, but it is not commensurate with a third of a final year project. They have done some work towards understanding the problem area. The student urgently needs to get moving and is likely to need substantial input from the supervisor
- (50-57) There may not be an interim product as such, but the student has clearly made a reasonable amount of progress in some way and shown some familiarity with the project area. The project plan has some oversights, and must be revised to facilitate success of the project. The student may not fully understand what will be required to produce an acceptable final product but should get there with help from the supervisor.
- (58-72) There is a modest but promising interim product and/or some practical work which will contribute substantially towards the final product, e.g. learning to use a specialised software tool or interfacing to an external API. They have shown a clear understanding of the technical and professional issues involved and have analysed the problem area. Some issues may have been overlooked but there should be a project plan which suggests the likely success of the project. The student clearly understands what they are trying to achieve.
- (73-87) The student has already designed and developed an interim product which shows great promise. They have performed a detailed analysis of the problem area and a feasible project plan. There is also evidence of creativity, and the ability to make good design decisions.
- (88-100) The student has already designed and developed an impressive interim product. They have performed a detailed analysis of the problem area leading to initial high-level designs for the system and a detailed feasible project plan. Considerable creativity, independence, and originality, is evident.

R1. Problem formulation (Well-motivated problem in socio-technical context)

- (0-34) Little or no effort demonstrated.
- (35-49) Show some, but unsatisfactory, effort in formulation and identification of a combination of societal, user, business and customer needs as appropriate.
- (50-57) Acceptable definition of project and project objectives / research problem. Basic level of consideration to identify and meet a combination of societal, user, business and customer needs as appropriate.
- (58-72) Effective definition of project. Project objectives / research problem is satisfactory, but lacks some detail in relevancy and justification. Acceptable level of consideration to identify and meet a combination of societal, user, business and customer needs as appropriate.
- (73-87) Clear definition of project. Project objectives / research problem are relevant and justified. Good level of consideration to identify and meet a combination of societal, user, business and customer needs as appropriate.
- (88-100) Clear definition of project. Project objectives / research problem are well-motivated and well-defined. Very detailed consideration to identify and meet a combination of societal, user, business and customer needs as appropriate.

R2. Background and Related Works

In the following statements, the meaning of the word 'literature' is extended, for development projects, to include study of related works, technical material in development, and background study of the problem domain.

- (0-34) Little or no effort demonstrated to study of the literature.
- (35-49) Show some, but unsatisfactory, effort in study of literature and relevant material.
- (50-57) Barely acceptable use of literature, showing weak links between the literature and the project topic.
- (58-72) Acceptable use of literature, showing mediocre links between the literature and the project topic.
- (73-87) Effective use of literature, showing explicit links between the literature and the project topic. Literature is reviewed in ways that are critical and analytical, not just descriptive.
- (88-100) The field is thoroughly surveyed and the report demonstrates clear mastery of the literature that explicit links are made between the literature and the project topic. There is a summary of the literature in so far as it relates to the project topic.

R3. Methodology (Analysis of problem and methodical design of solution)

- (0-34) No evidence in designing how to solve the problem.
- (35-49) Show some, but unsatisfactory, effort in solving the problem.
- (50-57) Basic relevant content is covered and is enough for a basic understanding of how the project is accomplished. Acceptable analysis of problem and design or implementation.
- (58-72) Some key points are covered with detail that is enough to fully understand how the project is accomplished in some aspects. Adequate analysis of problem in some aspects only. Basic utilization of supporting technology in system development to address the problem requirements. Design is carried out in a sensible way, but design decisions involving a range of possible solutions or techniques mostly not justified.
- (73-87) Most major points are covered with sufficient details so that others can understand how the project is accomplished. Good analysis of problem, with most major design decisions are justified. Familiarity of technical issues in some aspects of the design. Sufficient study and effective utilization of supporting technology in system development to address some of the problem requirements. Basic methodology in design of solution. Sound judgement is demonstrated regarding the choice of the best solution among many.
- (88-100) All major points are covered with sufficient details so that others can fully understand how the project is accomplished. Detailed analysis of problem. Analytical thinking in making all major design decisions, with comparison of options and justified decision. Familiarity of technical issues in most aspects of the design and their implication to the solution. Sufficient study and effective utilization of supporting technology in system development to address the problem requirements. Very good, methodical design of solution (e.g. software analysis and design, appropriate research methodology). The solution is shown to be outstanding with clear justification of its pros and cons.

R4. Outcome (Results and critical evaluation)

- (0-34) Little or no evidence of results and no conclusion.
- (35-49) Some very poor results presented but no attempt to analyze them or draw any conclusions.
- (50-57) Basic relevant content is covered and is enough for a basic understanding of the outcome of the project. Topic is relatively simple. The outcome provides trivial solution, and is evaluated on a basic level. Elementary discussion of results, but miss discussion of importance and impacts of results.
- (58-72) Some key points are covered with detail that is enough to fully understand the outcome and value of the project in some aspects. Topic is more difficult and requires some

study of new concepts. The outcome provides basic solution. Sufficient evaluation of the outcome quality in some major cases. Importance of results discussed in some aspects only. Some effort in the evaluation the environmental and societal impact of the solutions.

- (73-87) Most major points are covered with sufficient details so that others can understand the outcome and value of the project. Topic is demanding and suitable for a mature student. Study of new concepts is essential. The outcome provides solution to complex problems. Sufficient evaluation of the outcome quality in most cases, e.g. robust testing of software quality and/or critical performance comparison. Importance discussed and significance pointed out. Evaluation the environmental and societal impact at different stages of the solutions.
- (88-100) All major points are covered with sufficient details so that others can fully understand the outcome and value of the project. Topic is challenging and difficult. The outcome provides innovative solution to complex problems. Very good evaluation of the outcome quality, e.g. robust testing of software quality and/or critical performance comparison. Discussion of results is comprehensive and convincing with interesting implications pointed out. Evaluation the environmental and societal impact throughout the entire life-cycle of the solutions.

R5. Writing skills (Clear expression of ideas and arguments)

- (0-34) The writing is very poor and incomprehensible.
- (35-49) Frequent errors in spelling and grammar. Minimal attempt at paragraphing. Paragraphs are often strings of sentences.
- (50-57) Some errors in spelling and grammar. Topic sentences may be missing or incomplete in some cases. Paragraphs are occasionally weak or underdeveloped. Readable, but some parts are difficult to read and understand. Unclear and confusing presentation of ideas.
- (58-72) Few errors in spelling and grammar. A few problems in use of topic sentences. Paragraphs often have basic topic sentences and supporting material. Mostly readable, but some parts still require some effort to understand. Presentation of ideas is sometimes unclear and lacks logical sequencing. Ineffective transition in flow of thought.
- (73-87) A few errors in spelling and grammar. Paragraphs are mostly well developed, but some lack strong topic sentences and sufficient supporting material. Mostly readable in the whole report. Presentation of ideas generally clear and coherent. Effective transition in flow of thought.
- (88-100) Well proofread. Paragraphs are well developed, have strong topic sentences and sufficient supporting material. Clear expression of ideas and logical progression of ideas in

arguments. Presentation of ideas is very clear and coherent. Excellent transition in flow of thought.

P1. Presentation content

- (0-34) No submitted work, or the student is absent in the presentation.
- (35-49) Student is present in presentation / poster session, but the work fails to reach the barely acceptable standard.
- (50-57) Cover most important points, but lack detail in some cases. No major errors and misconceptions. Poor organization, but audience can still follow.
- (58-72) Cover most important points and include suitable detail in most cases. A few inaccurate or irrelevant points. Fair organization and there are some ad-hoc jumps in topics.
- (73-87) All major points covered and explained clearly and correctly. Information is organized mostly in logical and interesting sequence.
- (88-100) Major points strongly supported with suitable detail, e.g. system demonstration, and experiment results. Information is organized in logical, interesting sequence.

P2. Communication skills

- (0-34) Absent in presentation, or unable to communicate
- (35-49) Student attends the presentation, but his/her communication skill make it very difficult for audience to follow the oral presentation.
- (50-57) Confident and familiar in only some parts. The audience can follow most of the oral presentation with some effort. Poor time keeping (e.g. too short, or use up time in the middle of the presentation slides.) Answer at least one question correctly, may need clarifications.
- (58-72) Confident and familiar in most parts. The audience can follow most of the oral presentation with ease. Fair time keeping and allocation of time for some topics is inappropriate. Answer questions correctly, but need clarifications.
- (73-87) Confident and familiar throughout the presentation. Effective oral presentation of complicated information. Good time-keeping and suitable allocation of time for different topics. Answer questions correctly and concisely.
- (88-100) Confident and relaxed. Effective and attractive oral presentation of complicated information. Excellent use of presentation time. Handle difficult questions with ease and confidence.