



TAYLOR'S UNIVERSITY

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School of Engineering

**Electrical & Electronic Engineering
Group Project 2**

Subject Code: PRJ61003

Student Handbook

For

**Electrical & Electronics Engineering Program
(6th Semester / 3rd Year)**

August 2018

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i. School of Engineering Programme Educational Objectives (PEOs)

PEO1	Achieve a high level of technical expertise and excel in positions in Engineering practice, research or other fields they choose to pursue
PEO2	Conceive, design, implement and operate Engineering systems, processes and products that consider functionality, safety, cost effectiveness and sustainability using sound principles
PEO3	Assume and aspire to leadership positions at both multinational companies and enterprises
PEO4	Pursue lifelong learning, such as graduate studies and other continual professional development activities

ii. Electrical and Electronic Engineering Programme Outcomes (POs)

PO1	Apply the knowledge of mathematics, science, engineering practices, innovation techniques, entrepreneurship and human factors to provide value-adding solutions to complex Electrical and Electronic Engineering challenges.
PO2	Identify, formulate, analyse and document complex engineering challenges to arrive at viable solutions and substantiated conclusions.
PO3	Conceive, Design, Implement and Operate solutions for complex engineering challenges that meet specified requirements with appropriate consideration for public health and safety, cultural, societal, environmental and economical considerations.
PO4	Conduct research and investigation into complex challenges using methods which include experiment design, analysis of data and synthesis of information to provide valid conclusions.
PO5	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an awareness of the accompanying assumptions and limitations.
PO6	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, economical and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7	Explain the global impact of professional engineering solutions in societal, economical and environmental contexts and demonstrate knowledge of and need for sustainable development.
PO8	Apply professional and ethical responsibilities of engineering practice.
PO9	Effectively communicate complex engineering activities, both orally and in a written form, in both technical & non-technical contexts.
PO10	Function effectively as an individual and in multidisciplinary settings with the capacity to be a leader.
PO11	Recognise the importance of lifelong learning and engaging in continuous professional development activities in accordance with technological change.
PO12	Effectively manage projects in multidisciplinary environments and apply project management tools and techniques to one's own work, as a member and leader in a team to satisfy stakeholders requirements.













iii. Electrical and Electronic Engineering Group Project 2 Learning Outcomes (LOs)

On completion of this subject, students will be able to:

LO1	Demonstrate effectiveness in communicating technical activities in oral and/or written form (PO9)
LO2	Apply project management tools and techniques in effective project execution and closure (PO12)
LO3	Implement and Operate effective solutions for complex engineering challenges (PO3)
LO4	Apply professional and ethical responsibilities of engineering practice (PO8)
LO5	Demonstrate effectiveness as a team member and/or team leader (PO10)
LO6	Assess the designed solutions for complex engineering challenges against societal, health, safety, legal, economical and cultural issues (PO6)
LO7	Evaluate the functionality of prototype against design (PO4)
LO8	Identify activities to cope with technological needs of the future (PO11)
LO9	Analyse and document the solution for a complex electrical engineering challenge and draw substantiated conclusions. (PO2)

iv. PO-LO mapping:

For Electrical & Electronic Engineering Group Project 2:

		Programme Outcomes (POs) and Taylor's Graduate Capabilities (TGC)											
		PO 1 	PO 2 	PO 3 	PO 4 	PO 5 	PO 6 	PO 7 	PO 8 	PO 9 	PO 10 	PO 11 	PO 12 
Learning Outcomes, LOs	LO 1									X			
	LO 2												X
	LO 3			X									
	LO 4							X					
	LO 5									X			
	LO 6					X							
	LO 7				X								
	LO 8											X	
	LO 9		X										

v. MODULE INFORMATION

The module coordinator for Electrical & Electronic Group Project 2 is given as below:

Technical and Design expert: Dr. Phang Swee King

School of Engineering, Taylors University

Email : sweeking.phang@taylors.edu.my

Office : C5A.45

Ext. : 56295396

Timetable

Lectures: Refer to your portal

Discussions and/or Workshop: Refer to your portal

Remarks:

Any changes to this handbook shall be announced through TIMEs (Moodle)

1. Introduction

EE Group Project 2 is a project-based module offered for all Electrical & Electronic (EE) third year students. This module is compulsory and carries three (3) credit hours out of student's total credit hours.

Students are required to form and work in groups. Each group will report to the coordinator with whom they must consult regarding the practical aspects of the project and the writing of the documentation.

The assessment of this subject is based on:

- * Logbook
 - Mark: 15% of overall assessment
 - Date of Submission: Week 2, 4, 6, 8, 10, and 12
 - Type of Assessment: Individual
- * Final Report
 - Mark: 40% of overall assessment
 - Date of Submission: Week 12
 - Type of Assessment: Group
- * Presentation
 - Mark: 20% of overall assessment
 - Date of Submission: Week 13
 - Type of Assessment: Individual
- * Peer Assessment
 - Mark: 5% of overall assessment
 - Date of Submission: Week 13
 - Type of Assessment: Individual
- * Artefact Assessment
 - Mark: 20% of the overall assessment
 - Date of Assessment: Week 14
 - Type of Assessment: Group

2. Project Brief

The current group project is related to the application of drone surveillance system in industry. Appropriate hardware, software and/or mobile app will be developed to demonstrate the feasibility of the autonomous control of drone for surveillance purposes. The details of the project will be decided by the groups following the CDIO framework. In EEGP2, Implementation and Operation phases of the project should be emphasised.

Teams of students will be assigned into groups of three to four and each team works on the same project while the inter-team communication is vital for the successful delivery of the project. These groups will be formed according to the groups formed in EEGP1 in previous semester.

In addition, this capstone project needed to have significant input from industry, the teams would need to be exposed to the more commonly used industry practices and implement them in their conceptual model for the assembly plant. Specifically, the following key industry practices should be highlighted.

- Safety, Health and the Environment
- Sustainability
- Engineering Ethics
- Lean Manufacturing
- Project Management

The system must be safe to use and be of sound engineering analysis i.e. an efficient and effective engineering system. Performance of the system is related to integrating the system to the mechanical design fixtures, proper configuration of the software, and good consideration of users.

3. Student and Module Coordinator Requirements

This section provides guidelines about the project requirements that the Module Coordinator and students are expected to follow.

The students must:

- * keep all the evidences about the works that they have done.
- * show or submit their Logbook **regularly** for assessment.
- * submit all documents and information on the dates prescribed. **Note that all submission of documents for this module is to be made to the Module Coordinator.**
- * inform their Module Coordinator where their project work will be performed and where members of staff can contact them during the period they are working on their project.
- * attend and be punctual for meetings.
- * not plagiarise work of others.
- * comply to all laboratory rules and regulations and ensure safety at all times.

The Module coordinator is expected to:

- maintain regular contact with the student to supervise students' progress.
- work with students to clearly define the aims and objectives of the project and the envisaged end point.
- check evidences presented by the students and test their understanding about the learning outcomes.

4. Weekly Activities

Students are expected to allocate **7 hours per week** for this module, which shall include:

- **1 hour per week of project meeting with Module Coordinator**
- **1 hour per week of project discussion with all project group members**
- **5 hours per week of project work**
(which may include discussion, design, individual work, industrial visits (if any), project documentation and other project related work)

The schedule of the meeting should be determined by the Module Coordinator together with the students. Students are to present their progress and updates in their project, and present their Project Logbook to be signed by the Module Coordinator.

5. Resource Management

Students should submit their proposed budget to the **Module Coordinator** for approval. The deadline of submission should be decided by the Module Coordinator. Students should get approval from Module Coordinator prior to purchasing any component.

The project allowance is RM2000 for each team throughout both EEGP1 and EEGP2. Students are encouraged to use the used materials in the lab or in the storage room.

6. Logbook

The Logbook constitutes to **15%** of the overall assessment. Each student is required to use an individual Project Logbook which they will use to record all conceptual or detail design sketches, thoughts processes, testing procedures, meeting discussions, contact details of people involved in project, and all other information related to the project. A Project Logbook should be treated as a precompiled document of all ideas or thoughts of the project. There should be evidence of reflection in the logbook. The student's ongoing learning should be clearly recorded.

Students are to update the Logbook continuously and progressively. Each student is to **present their Logbook to project meetings with Module Coordinator** (once a week) for it to be assessed and **signed-off by the Module Coordinator**. Final marks on Project Logbook will be awarded by the module coordinator based on the progressive update of the Logbook and its required contents as detailed in the Logbook rubrics.

Project Logbook and LO portfolio shall be compiled together and submitted to Module Coordinator before the end of **Week 13**.

7. Final Report Writing Guidelines

The report constitutes to **40%** of the overall assessment. The objective of the report is to document all technical information of the project in such a way that a third party with the skill (i.e. an engineer) without the knowledge of the project is able to understand the area of interest of the project, objective, procedures involved, reasons behind material selection, project outcomes and recommended improvements of the project.

7.1. Content

Each group is required to submit a **group Final Report** which captures the details of work that they have performed throughout the semester. The report should address the engineering analysis of the technical solution, the Implement and Operate elements of the prototype, besides also covering project management, ethics and professionalism, and various issues related to the project. These are detailed in the Final Report rubrics. The Final Report should have all of the following sections:

Cover Page	
Table of Contents	
1.0	Introduction and Objectives
2.0	Engineering Analysis
3.0	Implementation
4.0	Project Management
5.0	Ethics and Professionalism
6.0	Societal, Health, Safety, Legal, Economical and Cultural Issues
7.0	Conclusions and Recommendations
8.0	References
9.0	Appendix
9.1	Engineering Drawings
9.2	(Any other attachments if there is such as technical data, component specifications, etc.)

7.2. Technical Operations & Maintenance Manual (TOMM)

Each team is required to submit a TOMM to guide users on the usage, safety and maintenance of their product. The TOMM is to be submitted as a separate document but at the same time as the Final Report. The TOMM may be submitted in written form or in multimedia form.

7.3. Project Report Submission Requirements

The softcopy of the Final Report should be submitted to the Module Coordinator before the end of Week 13 through TURNITIN in TIMES.

7.4. Formative Assessment of Final Report

Each team is required to submit a draft Final Report (hard copy) to the Module Coordinator at least two weeks before the date of actual submission. The Module Coordinator will review the draft and provide feedback to the students. No

marks are awarded for the draft submission. It is intended to be a formative assessment to help students achieve the Final Report requirements.

8. Artefact Assessment, Presentation and Peer Assessment

The **Presentation will be held in Week 13** while the **Artefact Assessment will be held in Week 14 during the Engineering Fair**. Both the Presentation and artefact assessment carries **20% each** of the total marks. The Presentation is assessed individually while the Artefact Assessment is assessed as a group. For the Presentation, students are required to present the part of work that they were involved individually. For the Artefact Assessment, students are expected to be familiar in the artefact presentation and are expected to be able to address questions that will be presented during the assessment.

Time and location of Artefact Assessment will at the Engineering Fair. Students are expected to check and be aware of the timing and location of the presentation. Any issues regarding the arrangement of the assessment **MUST be addressed** to the **Module Coordinator at least one week prior to date of assessment**.

On the day of Artefact Assessment, students are required to arrive at the location of assessment **5 minutes before the assessment time with all necessary tools and equipment to ensure the presentation runs smoothly with no interruptions**. Each group will be given approximately 10 minutes for group presentation and 10 minutes for each individual presentation.

Peer Assessment will be conducted through a Google Form survey. It is required that every group member participate in the Peer Assessment survey. The Peer Assessment constitutes **5%** of total marks.

9. Return-on-Failure (ROF)

Learning from mistakes is an important component of innovation. Without trying and failing and learning from failure, innovation would not be possible. Hence students are encouraged to perform failure analysis, reflection and learning from such an experience. Each student is required to submit a Return on Failure form in Week 7 and Week 13. This can be shown to the supervisor during the Logbook discussion.

10. TURNITIN Submission

The School adopts a very serious view concerning plagiarism. Plagiarism is academic misconduct that may result in a student failing this module. The **Final Report** is required to be submitted to TURNITIN. The Final Report should not exceed a TURNITIN similarity limit of 30%. In addition the students are not allowed to transcribe directly (cut and paste) any material from another source into their submission. The Final Report will not be assessed if it has not been evaluated for plagiarism. Not being assessed means no marks awarded.

11. Late Submission Penalty

Late submissions will be subjected to a mark deduction penalty following the policy of the School, which is a deduction of 10% for the first day and 5% for each subsequent day late. A weekend counts as 1 day. Submissions that are later than one week will not be accepted. **This penalty policy applies to all assessments of this module.**

12. Project Closure and Claims Procedures

Each project group needs to ensure that the project is properly closed before marks for this module is released to students. Project Closure requires students to complete all activities below:

1. Cleaning up of lab area / workplace used to perform project discussion or coursework for the entire semester. This could either be the lab, workshop, classroom, discussion room, concourse or all other areas that has been used by students for the purpose of the project. The area has to be cleaned to its original condition.
2. Returning of machines, equipment, accessories or parts used for the project which was obtained by means of sponsorship, bought for the project by the university or bought by students in which the cost of purchase is reimbursed by the university or sponsorship fund. Students are to return these items to the **Assistant Lab Manager, Mr Rahim (or his assigned representative) and obtain his signature on the Project Closure Form.**

Once the form is duly signed, it shall be **submitted to the Module Coordinator before the end of Week 14**. Each group is to submit **one** form.

The Claim Details Form and the Submission for Claim Acknowledgement Form must be attached with all the original receipts. The original receipts should be neatly glued to A4 sized papers. These two Claim forms and the receipts are to be submitted together with the Project Closure Form in Week 14 to the Module Coordinator. Note: Order invoices are not receipts. Invoices are not considered proof of payment hence they are not acceptable for claims. Claims can only be approved based on **proof of payment** (and only for items on the prior approved budget).

If receipts are not available for certain online purchases, a printout of the invoice accompanied by the student's bank statement indicating payment to the vendor may be submitted as proof of purchase. The bank statement must show the same vendor and the same amount as that on the invoice. Barring such exceptional circumstances, only receipts are acceptable as proof of payment in all cases. Please ensure to keep all your receipts. Without receipts, no claims are allowed.

Upon receiving their claims through the Module Coordinator, the student is required to sign and submit the Payment Receipt Form to the Module Coordinator.

A copy of the Project Closure Form, the Claim Details Form, the Submission for Claim Acknowledgement Form and the Payment Receipt Form can be obtained at the next section of this Handbook.

13. Project Closure Form

Project Closure Form

(Print **ALL** pages. For cases in which students are not claiming for project parts, please print the first **TWO** pages)

TAYLOR'S UNIVERSITY

SCHOOL OF ENGINEERING

PROJECT TITLE:

SUPERVISOR'S NAME:

PART NAME	DATE OF RETURN	CHECKED BY	DATE

Lab housekeeping:

1. Cleanliness

All rubbish and used parts have been disposed from bench tops and floors, machines (blades, cutting jigs, etc) cleaned and returned to original state

Yes No **2. Properties**

All lab equipment, books, catalogues, etc borrowed by students have been returned

Yes No **3. Safety**

All safety measures have been taken, i.e. no liquid spills, machines turned off, power switched off, sharp objects removed / covered to avoid injury, liquid bottles sealed and kept in designated storage area, no obstructing items that can cause trips / falls, etc.

Yes No

Checked by

LAB OFFICER/ TECHNICAL OFFICER:.....

DATE:.....

Verified by

Module coordinator:.....

DATE:.....

14. Claim Details Form
Claim Details

Item No.	Receipt date	Amount (RM)	Remark	Group	Contact person/email	Bank Account

Module coordinator's signature:

 (Name: _____)

15. Submission for Claim Acknowledgement Form

Submission for Claim Acknowledgement

I, _____

I/C Number _____ have submitted claims

of RM _____ with attached original receipts verified by module

coordinator named _____, for project

module _____, Sem Mar/Aug _____.

I also acknowledge that I've been authorized by my team members to receive the claimed money.

Signature of Student,

Signature of Module Coordinator,

(Name: _____)

Date:

(Name: _____)

Date:

Signature of Stream Coordinator,

(Name: _____)

Date:

16. Payment Receipt Form**Payment Receipt**

I, _____

I/C Number _____ have received an amount

of RM _____

from _____, School of Engineering.

Signature of Recipient,

Signature of Module Coordinator,

(Name: _____)

Date:

(Name: _____)

Date:

17. Appendix

17.1. Logbook Rubric

Area	LO	Total Score	Weight	Actual Mark	Scoring Band	Criteria
Formatting	LO1	20	2	10	8-10	Weekly submissions are neat and comprehensive with clear justifications.
					5-7	Weekly submissions are comprehensive but not arranged accordingly. Some justification is available.
					0-4	Weekly submissions are presented in an untidy manner with minimal or no justifications.
Evidences	LO1	20	2	10	8-10	All evidences of project activities are available at the end of the logbook submission, and a fully completed project closure form submitted.
					5-7	Important evidences of are available at the end of the logbook submission, and a fully completed project closure form submitted.
					0-4	Insufficient evidences.
Portfolio	LO1	20	2	10	8-10	All the evidences for LOs and POs attainment are accurately referred to in the portfolio.
					5-7	Important evidences for LOs and POs attainment are accurately referred to in the portfolio.
					0-4	Insufficient evidences for LOs and POs attainment are referred to in the portfolio.
Self-learning activities	LO8	20	2	10	8-10	All the voluntary and self-motivated pursuit of knowledge for doing the project at the best level are clearly explained in the logbook with details.
					5-7	Some of the voluntary and self-motivated pursuit of knowledge for doing the project are clearly explained in the logbook.
					0-4	The voluntary and self-motivated pursuit of knowledge for doing the project are not adequately explained in the logbook.
Fluency & Clarity	LO1	20	2	10	8-10	The presentation of the submission was fluent and concise, with minimal grammatical errors in the English Language.
					5-7	The presentation of the submission was mostly fluent and rather concise with only average grammatical errors in the English Language.
					0-4	The presentation of the submission was hesitant and unclear
Total		100				

17.2. Final Report Rubric

Area	LO	Total Score	Weight	Actual Mark	Scoring Band	Criteria
Format		5	0.5		8-10	Has all the sections and presented in a neat and tidy manner.
					5-7	Has most sections presented in a neat and tidy manner.
					0-4	Inadequate sections.
Introduction & Objectives		5	0.5		8-10	Precise and concise summary that gives clear overall view of the project and its outcomes. Objectives are clearly stated.
					5-7	Moderately precise summary with overall view of the project and outcomes. Objectives somewhat clearly stated.
					0-4	Poorly constructed executive summary with many vague areas. Objectives are unclear.
Engineering Analysis	LO 9	20	2		8-10	Every part of the technical solution is substantiated by engineering analysis. These analyses are well developed and showed clear understanding of the relevant engineering principles used.
					5-7	Most parts of the technical solution are substantiated by engineering analysis. These analyses showed understanding of the relevant engineering principles used.
					0-4	Most of the technical solution is not substantiated by engineering analysis.
Engineering Drawing	LO 9	10	1		8-10	An entire set of engineering drawings of the assembly and parts are documented. These drawings fully comply with drawing standards. (Engineering Drawings may be attached to the Appendix)
					5-7	An entire set of engineering drawings of the assembly and parts are documented.
					0-4	The set of engineering drawings is incomplete.
Implement	LO 3	15	1.5		8-10	System development, fabrication processes and testing procedures are clearly explained and well justified. Functionality of the prototype is evaluated on its implications on manufacturability, testability, usability, ease of maintenance and sustainability.
					5-7	System development, fabrication processes and testing procedures are explained and justified. Functionality of the prototype is evaluated on its implications on some of these elements - manufacturability, testability, usability, ease of maintenance and sustainability.
					0-4	System development, fabrication processes and testing procedures are explained without clear justification. Functionality of the prototype is not evaluated on its implications on most of these elements - manufacturability, testability, usability, ease of maintenance and sustainability.
Operate	LO 3	15	1.5		8-10	Developed a Technical Operations and Maintenance Manual that is well organized for the end user and contains all the required information.

						(The TOMM may be in either written or multimedia format)
					5-7	Developed a Technical Operations and Maintenance Manual that is organized and contains most of the required information.
					0-4	Developed a Technical Operations and Maintenance Manual that is not well organized and does not contain most of the required information.
Project Management	LO 2	5	0.5		8-10	Project management tools and techniques are effectively applied to project execution and project closure. At least one tool each to execution and closure respectively.
					5-7	Project management tools and techniques are applied.
					0-4	Project management tools and techniques are incorrectly applied or not applied.
Ethics and Professionalism	LO 4	5	0.5		8-10	Identifies key ethical and professional issues associated with the project and discusses these issues thoroughly.
					5-7	Identifies some ethical and professional issues associated with the project and discusses these issues.
					0-4	Did not identify ethical and professional issues associated with the project or identified some but did not discuss them.
Societal, health, safety, legal, economical and cultural issues	LO 6	5	0.5		8-10	Critically assessed the designed solution against societal, health, safety, legal, economical and cultural issues.
					5-7	Assessed the designed solution against any 3 to 5 of these issues - societal, health, safety, legal, economical and cultural.
					0-4	Assessed the designed solution against any 2 or less of these issues - societal, health, safety, legal, economical and cultural.
Conclusions and Recommendations		5	0.5		8-10	Closed the project in a professional manner documenting important and relevant conclusions and recommendations for improvement.
					5-7	Closed the project and documented substantial conclusions and relevant recommendations for improvement.
					0-4	Project was not adequately closed and conclusion documented is not relevant.
References / Appendix		5	0.5		8-10	All of the referencing is presented in a proper format with most up to date references. All evidences, attachments, appendices are clearly attached to support items presented in the project report.
					5-7	Most of the referencing is presented in proper format. Evidences, attachments, appendices are mostly attached but there are items presented in the project report that does not have supporting documents.
					0-4	The referencing is presented in wrong format. No evidence, attachments, appendices are attached.
English		5	0.5		8-10	No mistakes in grammar, spelling, punctuation
					5-7	Few mistakes in grammar, spelling, punctuation
					0-4	Many mistakes in grammar, spelling, punctuation
Total		100				

17.3. Presentation Rubric

Area	LO	Total Score	Weight	Actual Mark	Scoring Band	Criteria
Project Achievement	LO7	30	3		8-10	Student explains thoroughly all the deliverables that the project has achieved and provided an in depth knowledge in the subject by relating the Learning Outcomes to the project work. A thorough overview of the project was provided with all key areas covered in a concise and precise manner.
					5-7	Student explains partially all the deliverables that the project has achieved and provided an in depth knowledge in the subject by relating the Learning Outcomes to the project work. A thorough overview of the project was provided with all key areas covered.
					0-4	Student explains partially all the deliverables that the project has achieved and showed poor knowledge in the subject. An unclear overview of the project was provided with lacking key areas covered.
Recommendations for Improvement	LO7	20	2		8-10	Student provides 4 to 5 recommendations for improvements in the project work from their observation and experience working on the project with appropriate and accurate justification. Evidence and supporting materials for all recommendation was also provided.
					5-7	Student provides 1 to 3 recommendations for improvements in the project work from their observation and experience working on the project with appropriate and accurate justification. Evidence and supporting materials for all recommendation was also provided.
					0-4	Student failed to provide and recommendation for improvements for the project.
Outline and Flow of Presentation	LO1	10	1		8-10	The outline of the presentation is clearly stated at the start. The flow of the presentation is well-ordered, smooth and has a logical sequence.
					5-7	The outline of the presentation is stated at the start. The flow of presentation is fairly smooth.
					0-4	The outline of presentation is not clearly stated. The flow of presentation is disjointed.
Fluency and Clarity of Presentation	LO1	20	2		8-10	The presentation was fluent and concise, with no pauses or grammatical error.
					5-7	The presentation was mostly fluent and rather concise with only small faults, and slight hesitant.
					0-4	The presentation was hesitant and unclear.
Q&A: Clarity & Thoroughness of Response	LO1	20	2		8-10	Able to answer all questions posed clearly, accurately and comprehensively.
					5-7	Able to answer most questions posed with a certain degree of clarity, accuracy and comprehensiveness.
					0-4	Unable to answer questions posed with any level of clarity, accuracy and comprehensiveness.
Total		100				

17.4. Peer Assessment Rubric

Area	LO	Total Score	Weight	Actual Mark	Scoring Band	Criteria
Contributions	LO5	20	2		8-10	Routinely provides useful ideas when participating in the group and in classroom discussion. A leader who contributes a lot of effort.
					5-7	Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who tries hard!
					0-4	Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.
Problem-solving	LO5	20	2		8-10	Actively looks for solutions to problems.
					5-7	Refines solutions suggested by others.
					0-4	Does not try to solve problems or help others solve problems.
Attitude	LO5	20	2		8-10	Proactive and always has a positive attitude about the task(s).
					5-7	Moderately proactive and often has a positive attitude about the task(s).
					0-4	Not proactive and has a negative attitude about the task(s).
Focus on the task	LO5	20	2		8-10	Consistently stays focused on the task.
					5-7	Focuses on the task for most of the time.
					0-4	Rarely focuses on the task.
Working with others	LO5	20	2		8-10	Always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.
					5-7	Usually listens to, shares, with, and supports the efforts of others. Does not cause problem in the group.
					0-4	Rarely listens to, shares with, and supports the efforts of others. Not a good team player.
Total		100				

17.5. Artefact Assessment Rubric
Taylor's Engineering Fair Awards
ME/EE Taylor's Capstone Project Award 2
Project Title:
Judge:

5= Excellent 4= Good 3= Average 2=Weak 1=Poor

Criteria	Definition	Band	Score
Project Impact (LO6)	The solution of the designed project has demonstrated considerations in the following areas: <ul style="list-style-type: none"> • SOCIETY - Has positive impact on the society. • HEALTH - Imposes no health risks to the users. • SAFETY - Is safe to use. • LEGAL - Has no legal violation. • ECONOMY - Has economical value. • CULTURE - Considers the cultural values. 	VOID	
		(1-5) Marks	
		(1-5) Marks	
		(1-5) Marks	
		(1-5) Marks	
		(1-5) Marks	
		(1-5) Marks	
Prototype Evaluation (LO7)	The developed prototype of the project is very closed to the planned design in terms of: <ul style="list-style-type: none"> • ARTEFACT - Artefact shows design aesthetics. • FUNCTIONALITY - All the functions planned in the design are implemented • MANUFACTURABILITY - The prototype is easy to be manufactured. • PRESENTATION - Exhibition booth and explanation provided by group members were accurate, knowledgeable, clear and shows teamwork cohesiveness 	VOID	
		(1-5) Marks	
		(1-5) Marks	
		(1-5) Marks	
Total score for Capstone Project Award (Total = 50 marks)			
Successful rate 5= Excellent 4=Good 3=Average 2= Week 1= Poor			
Additional comments from Judge:			