

COURSE ASSESSMENT REPORT

**ROY G. PERRY COLLEGE OF ENGINEERING
ELECTRICAL AND COMPUTER ENGINEERING
DEPARTMENT
PRAIRIE VIEW A&M UNIVERSITY**

ASSESSMENT REPORT COVER PAGE

**ELEG 4247 SENIOR DESIGN &
PROFESSIONALISM I**

FALL 2021 SEMESTER

NAME OF INSTRUCTOR: Vewiser Turner & Sarhan Musa

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 - 5.1 Assignments assessing students' ability to communicate effectively with a range of audiences, orally (outcome 3-part I). Assignments assessing students' an ability to communicate effectively with a range of audiences written technical communication (outcome 3-part II)
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Detailed Course Syllabus
(Distributed to Students at the beginning of the Semester)

ECE Syllabus in ABET Format

ELEG 4247 Senior Design & Professionalism I

1.	Course number and name:	ELEG 4247 (Sr Design - Part I) ELEG 4287 (Sr. Design - Part II)
2.	Credits:	2 credit hours Subject Area: Engineering Topics
3.	Instructor's or course coordinator's name:	Mr. Vewiser J Turner, Jr Sarhan Musa
4.	Text book: Title:	PVAMU Sr Design Manual
	a. Other Supplemental material	Instructor developed material and topic example
5.	Specific course information	
	a. Brief description of the content of the course (catalog description)	ELEG 4247/4287 Sr Design & Professionalism Part I and Part II: These courses are a two-semester capstone experience involving engineering design of an industrial or advanced team project. Elements of ethics and professionalism in engineering practice will be integrated into the project experience. The project will include application of relevant engineering codes and standards, as well as realistic constraints. Design achievements are demonstrated by written reports, oral presentation, and professional standards and ethics examinations.
	b. Prerequisites or Co-requisites	MCEG 2013, GNEG 3061, CVEG 2454, CHEG 2003, COMM 1003, ELEG 2011, ELEG 3063, ELEG 3043, PHYS 2511, PHYS 2521, GNEG 2021, GNEG 1121, CHEM 1021.
	c. Indicate whether a required, or elective,	Required
6.	a. Specific goals for the course specific outcomes of instruction (e.g. The student will be able to explain the significance of current research about a particular topic.) <i>Students will be able to :</i>	b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. <i>The specific goals for the course specific outcomes listed on the left column will address the following student learning outcomes:</i>
	- Understand the given problem and identify the subject area and concepts involved - Convert the problem into a well labeled sketch or appropriate representation (free body diagram, flow chart, functional block diagram, schematic diagram, etc.) - Formulate the complex engineering problem into an engineering model or design – showing any math or science or technology needed to validate the	Outcome 1 (ELEG 4287 Only) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

	- design - Design a practical solution to address the problem - Identify parts and other needed capability (like coding) to solve the problem or proposal - Deliver a final solution that integrates all aspects of the design from hardware to software	
	- Identify and list the design objectives, customer/marketing requirements and constraints - Develop a project management plan using, Gantt type charts - and break down work into tasks/ subtasks and identify the deliverables for each person. Also, establish milestones to track progress. - Identify and gather the types of information needed for a complete understanding of all aspects of the project	Outcome 2 (ELEG 4287 Only) An ability to (1) apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factor
	- Prepare an executive summary for the report - Prepare the written report in accord with the Senior Projects Report Manual and instructor guidance including all tables, charts, graphs and literature references	Outcome 3A (ELEG 4247 & 4287) An ability to communicate effectively with a range of audiences (Written Technical Communication)
	- Use vocabulary appropriate to technical subject and audience with clarity and confidence - Demonstrate broader impacts of project (where applicable on society, economics, technical, environmental, safety)	Outcome 3B (ELEG 4247 & 4287) An ability to communicate effectively with a range of audiences, orally
	- Demonstrate Understanding Professional Code of Ethics - Identify ethical impact on Safety, Environmental, Technical, Global or Cultural as appropriate	Outcome 4 (ELEG 4247 & 4287) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments
	- Function Effectively on a Team - Able to establish goals and objectives - Able to resolve conflicts	Outcome 5 (ELEG 4247 & 4287) An ability to (1) function effectively on a team whose members together (1) provide leadership, create a collaborative and inclusive environment, (3) establish goals, plan tasks, and meet objectives
7	Brief list of topics to be covered	Topic 1 - Setting the Stage Topic 2 - Forming Teams/Project Selection Topic 3 – Business/Project Identification of Needs

	Topic 4 – Weekly Progress Report Topic 5 – Matrix and Literature Review Topic 6 – Impact on Society, Safety, etc. Topic 7 – Project Comparison Topic 8 – Project Planning Topic 9 – Ordering of Parts Topic 10 – Design Constraints and Assumptions Topic 11 – Codes and Standards Topic 12 – Executive Summary Topic 13 – Engineering Ethics Laboratory Time on Thursday's that allow students to work on project design <u>As needed:</u> - In class practice presentations - Periodic Project and or Presentation Checkpoint - Some topics may be repeated to ensure students comprehend the subject <u>Other:</u> Outside Industry speakers (up to 3 per semester) will join the class to talk on various Professionalism topics
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End of Semester Course Assessment Report

This summary contains the following Information

1. Performance Statistics

- Total number of students in class
- The class average performance **(stated as %)** in each course outcome assessed in this class and the **two previous times course was assessed.**
- The acceptable class average for the class in each outcome area as set by your Department. **You cannot use any number of your choice**
- Percentage of students who scored below the expected average in each outcome.

2. Implementation Summary

- Brief summary of plans implemented during the semester based on last assessment report

3. Perceived Problems

- Instructor's **critical evaluation** of perceived problems that affected students' performance. **Realistic problems should be identified throughout the semester and summarized in this section of the report.**

4. New Plans for Addressing Problems

- Instructor's plans for addressing the perceived problems the next time the class is taught. **These should be specific enough for another instructor to implement. Most of these should be things that, you, the instructor can implement to help students to improve. Be creative.**

5. Overall Trend over last three assessment periods

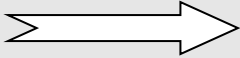
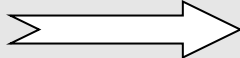
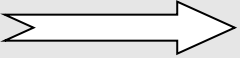
- Instructors summary of overall performance trend for each outcome measured over the last three periods.

5. Were Expectations Met?

- Answer **YES** if the **class average was above the expected average** and the **stated percentage of students** scored at or above the expected average, else answer **NO.**

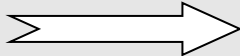
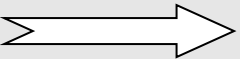
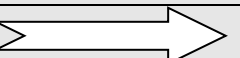
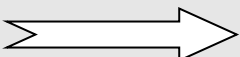
END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT
ELEG 4247-P01 SENIOR DESIGN & PROFESSIONALISM I/ FALL 2021 SEMESTER
(ELECTRICAL ENGINEERING STUDENTS)
Fall 2021 SEMESTER

Report Prepared by: Turner & Musa
 Report Date: December 2021

Semester	Analysis Type	Number of Students	Outcome 3 – Oral Communication An ability to communicate effectively with a range of audiences			Outcome 3 – Written Technical Communications An ability to communicate effectively with a range of audiences		
			Expected Average	Class Average	% Students Above Expected Average	Expected Average	Class Average	% Students Above Expected Average
Fall 2021	Direct	26 - EE	80	88	92	80	87	100
Fall 2020	Direct	33 - EE	80	92	100	80	94	100
Fall 2019	Direct	19 - EE	80	90	100	80	91	100
Implementation Summary			We had several interim oral presentations before mid-term and finals oral presentation which provided tips and adjustments to ensure students had training. Also provided feedback and examples for written presentations so teams had chances to correct shortcomings.			We used the oral presentation information as the basis and starting point for the written portion of this outcome. We discussed the difference of an oral presentation vs a written document. The written document must be detailed and informative – it must stand in its own.		
Perceived Problems			We spend a lot of time just getting students to learn how to make good oral presentation. Some students are reluctant to speak in larger group setting and some students have not spent enough time preparing their portion of the presentation. This year we seem to have more students who are very weak at oral communications, and they did not submit their assignments by the deadline which is a minus 10 points of the score.			Sometimes translating technical information is a challenge for students. Varying skills and ability to develop well written documents. Sometimes students may not follow formatting instructions. This year we seem to have more students who are very weak at written communications, and they did not submit their assignments by the deadline which is a minus 10 points of the score.		
Plans for Addressing Problems			We need to have more practice sessions for some students where oral communications are weak. Also, we have some students who should prepare a written speech and practice (rehearse) more as a team.			Need to show examples of good written documents. Also, we will provide one on one feedback to each team to show areas for improvements. Must emphasize to the students to meet the deadline in turning the assignments.		
Overall Trend over Periods			Overall trends continue to be good, emphasize more individual practice. We saw more late submission this year which cause scores to be lower.			We saw more late submission this year which cause scores to be lower.		
Were Expectations Met?			YES			YES		

END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT
ELEG 4247-P01 SENIOR DESIGN & PROFESSIONALISM I/ FALL 2021 SEMESTER
(ELECTRICAL ENGINEERING STUDENTS)
Fall 2021 SEMESTER

Report Prepared by: Turner & Musa
 Report Date: December 2021

Semester	Analysis Type	Number of Students	Outcome 4			Outcome 5		
			An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives		
			Expected Average	Class Average	% Students Above Expected Average	Expected Average	Class Average	% Students Above Expected Average
Fall 2021	Direct	26 - EE	80	97	96	80	90	100
Fall 2020	Direct	33 - EE	80	86	85	80	100	100
Fall 2019	Direct	19 - EE	80	91	100	80	96	100
Implementation Summary			We had long lecture on ethics, and we also discussed a couple of scenarios in class so that the students can learn from each other and have a group conversation. This ethics assignment was individual test and students had more time to prepare for possible test questions.			For this outcome we leverage project GANTT chart details, but more emphasis placed on Team Contracts and Weekly Team Progress reports. Students pick their own teams – we do not force them into a team.		
Perceived Problems			No perceived problems, students seem to do better in indivial test when they are given more time to prepare.			Not all students have been trained or exposed to developing detail project timelines. We are very concerned that the Project Management course in the College of Engineering is not preparing students to develop strong GANTT charts. We don't have the time in Sr Design to do an effective job teaching Project Timelines and GANTT charts or Microsoft Projects.		
Plans for Addressing Problems			We will continue to have a mix individual test and team assignments to ensure collaborations and better understanding of ethics.			We have to give students good GANTT charts examples of previous teams to ensure we can meet this outcome for project task planning.		
Overall Trend over Periods			We don't have adequate time in the Fall and Spring to cover Ethics each semester – this should be done and measured in other ECE courses as well. Students should get exposed to ethics more often and earlier than senior design. Additional time could be used for oral or written weaknesses.			We provided several good examples and spent several lectures plus outside the class time to help closing the gap. We do not have time in this course to teach project GANTT charts.		
Were Expectations Met?			YES			YES		

**Grade Sheet Showing
Student and Class Performance in Outcomes
The computed semester average in each outcome
as stated in the Assessment report are
highlighted in boldface**

ELEG 4247-P01 SENIOR DESIGN & PROFESSIONALISM I/ FALL 2021 SEMESTER
(ELECTRICAL ENGINEERING STUDENTS)
 Fall 2021 SEMESTER

Report Prepared by: Turner & Musa
 Report Date: December 2021

Stud. #	Outcome 3 Oral				Outcome 3 Written				Outcome 4		Outcome 5	
	Oral Presentation Mid Term	Oral Presentation Final	Oral Average		Written Presentation Mid Term	Written Presentation Final	Written Average		Ethics Assignment		Team Contract/Weekly Report	
1	85	95	90		89	82	86		95		90	
2	85	94	90		85	80	83		100		90	
3	85	97	91		85	100	93		100		90	
4	85	87	86		85	80	83		100		90	
5	90	97	94		90	100	95		100		90	
6	70	79	75		84	80	82		95		90	
7	85	97	91		85	100	93		95		90	
8	85	97	91		100	82	91		80		90	
9	90	98	94		100	100	100		95		90	
10	80	87	84		85	80	83		95		90	
11	85	95	90		89	82	86		95		90	
12	80	87	84		85	80	83		90		90	
13	90	97	94		90	100	95		100		90	
14	85	97	91		85	100	93		95		90	
15	85	97	91		100	82	91		100		90	
16	80	94	87		85	80	83		100		90	
17	80	87	84		85	80	83		100		90	
18	80	87	84		85	80	83		100		90	
19	85	95	90		85	82	84		100		90	
20	85	95	90		85	82	84		100		90	
21	85	97	91		89	82	86		100		90	
22	70	79	75		84	80	82		95		90	
23	90	97	94		90	100	95		100		90	
24	85	93	89		89	82	86		100		90	
25	85	97	91		85	100	93		100		90	

26	80	94	87	-	85	80	83		100		90	
27	80	94	87	-	85	80	83		100		90	
28	85	97	91	-	100	82	91		100		90	
29	85	97	91	-	85	100	93		80		90	
30	90	98	94	-	100	100	100		100		90	
31	70	79	75	-	84	80	82		90		90	
32	80	87	84	-	85	80	83		95		90	
33	90	98	94	-	100	100	100		95		90	
34	90	98	94	-	100	100	100		100		90	
35	90	97	94	-	90	100	95		100		90	
36	70	79	75		84	80	82		100		90	
37	70	79	75		84	80	82		95		90	
38	85	97	91		100	82	91		100		90	
39	90	97	94		90	100	95		100		90	
40	90	98	94		100	100	100		95		90	
	Outcome	3 - Oral				3 - Written			4- Ethics		5-Team	
Avg	Overall		88.08				88.64		97.00		90	
Avg	EE		88.19				87.31		97.31		90	
Avg	CE		87.86				91.11		96.43		90	

**OUTCOME SPECIFIC ASSIGNMENTS
USED TO ASSESS OUTCOMES**

(Provide at least two assignments used to specifically measure each outcome and justify the suitability of the assignments for the outcome being measured)

ASSIGNMENTS FOR OUTCOME 3

An ability to communicate effectively with a range of audiences (Oral Communication)

Electrical and Computer Engineering
OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET
ELEG 4247 – Sr Design and Professionalism I
FALL 2021
Instructor: Turner / Musa

Title of Assignment

Final Oral Presentation

Outcome Measured Using this Assignment

Outcome 3

**An ability to communicate effectively with a range of audiences
(Oral Communication)**

Check the communication characteristics related to this assignment

X	Involves ability to organize, plan, design/prepare and use appropriate visual aids for communication/presentation to a range of audiences (executives, technical and non-technical).
X	Involves ability to demonstrate technical knowledge and understanding of the subject, prepare and display prototypes or models when they are necessary, respond clearly to questions in a professional manner
X	Requires use of correct grammatical English and technical terms appropriate to technical area and audience type; ability to speak with clarity and confidence, maintain good posture and eye contact with the audience
	Geared to diverse groups of stakeholders (students and industrial representatives, etc.)

Brief justification of the suitability of assignment for the outcome

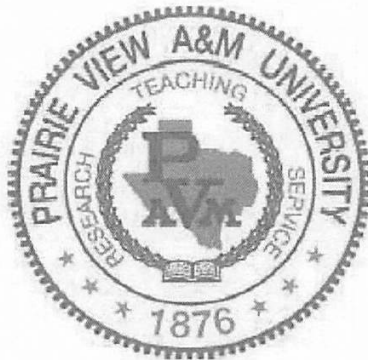
For ELEG 4247 Oral Presentation will be made for faculty and students only – we invite external and industry audience participation in the Spring for ELEG 4248 – it's not practical to expect industry reps to miss work for both Fall and Spring plus it's really in the Spring when Sr Design has a finished product

ELEG 4247 Senior Design

Fall 2021

Outcome 3 – Oral

**PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING**



**Senior Design & Professionalism I
ELEG 4247 – P01**

Final Exam Presentation

Due Date Monday November 15 by 5:00pm (Central Time)

Upload to Final Exam Oral Assignment

You will have 25 mins per team plus 10 mins for Questions

This document will serve as your final exam presentation

10-point reduction if late – PowerPoint Slides only no PDF slides

Each Team will control its own slides on day of presentation

Each person is expected to cover some portion of the presentation

Business Casual Dress (we might have guest) – Face to Face Only

To be fair to all teams no changes can be made after submitted

You will have 25 mins per team plus 10 mins for Questions

Use your mid-term presentation as a starting point, your Final presentation should include:

1. Project Title, List of Team Members with Picture including academic majors and team member roles – be sure to add Faculty Sponsor and Course Facilitator on either your cover slide or team intro slide
2. Problem Statement – what problem are you trying to solve
3. Project Objective – what are you doing to try to deliver or develop
4. Marketing and Engineering Requirements and Justification
5. Proposed Deliverables – what are you actually going to deliver
6. Constraints
7. Assumptions
8. Design Methodology
 - How did you arrive at your proposed design?
 - Show Math and/or Engineering Considerations used
9. Preliminary Design Concept
 - What is your preliminary design or proposal – need a diagram, schematic or picture of integration
10. Show your Project Acceptance Criteria
11. Include a comparison slide to show your product versus other options
 - Brief overview of the competitive landscape – what other concepts are you competing with (what you gained/learned from literature review)
 - List advantages/disadvantages of your proposed design
12. Show broader technical/societal/economic impacts – include data charts, graphs
13. High Level Project Schedule
14. Project Parts Summary
15. List of references from your literature review (refer to proper format on eCourse)
16. Snapshot of what your team has accomplished so far
17. At end of presentation a page should read “Questions “so we will know you are done presenting
18. After Questions slide – please have a slide called “Back Up “
19. Please number all slides
20. Everyone on the team should cover something in the presentation

(Refer to next page for some guidance)

Presentation Order

Wednesday November 17: Team 8

Thursday November 18: Team 1,2,3,4,5,6,7

Note – Order of Team Presentations may change pending outside guest schedule

All students must attend both days – you are not excused unless pre-arranged with Professor Turner

Project Presentation Evaluation Form
ECE Senior Design & Professionalism
Oral Presentation – Outcome 3

Title of Presentation: Team 4 – Converting Mechanical to Electronic Operated System						
Members: Armand Baweu, Jacqueline Torralba, Franky Lonfo, Franisco Hernandez, Eulises Garcia						
Date of Presentation: VST						
Name of Evaluator and Affiliation (University or Company name)						
	Excellent 99	VeryGood 89	Average 79	BelowAvg. 69	Poor 54	Comments
Organization						
Objective	✓					
Introduction of Presentation	✓					
Design Methodology (Design Process)						
Ability to stay within time limit						
Technical						
Technical content and demonstration of understanding of subject	✓					Really nice prototype
Quality of design/ Analysis/Construction	✓					
Creativity and originality of design concepts	✓					
Design within constraints	—					
Proper use of codes and standards in design	—					
Able to demonstrate broader impacts of project (where applicable on society, economics, technical, environmental, safety)	✓					
Quality and functionality of working prototype	✓					
Delivery						
Use of vocabulary appropriate to technical subject and audience, clarity and confidence	✓					Good Demol!
Attire, posture and eye contact	✓					
Efforts of all group members/Group dynamics	✓					Good Answering question
Ability to effectively answer questions						
Quality/Readability of slides	✓					
Relevance of Slides – use of modern techniques i.e. video, animation, sound clips etc.	✓					

slide 9 - color
 slide 11 Blue/Black
 slide 13 which one did you select?
VST=99
WUSA=90
97

Red light bouncing back
 Franky!
 slide 15/16

Project Presentation Evaluation Form
ECE Senior Design & Professionalism
Oral Presentation – Outcome 3

Title of Presentation: Team 4 – Converting Mechanical to Electronic Operated System						
Members: Armand Baweu, Jacqueline Torralba, Franky Lonfo, Franisco Hernandez, Eulises Garcia						
Date of Presentation: 11/18/2021						
Name of Evaluator and Affiliation (University or Company name) <i>Musa</i>						
	Excellent 99	VeryGood 89	Average 79	BelowAvg. 69	Poor 54	Comments
Organization						
Objective	✓					
Introduction of Presentation	✓					
Design Methodology (Design Process)	✓					
Ability to stay within time limit	✓					
Technical						
Technical content and demonstration of understanding of subject	✓					
Quality of design/ Analysis/Construction	✓					
Creativity and originality of design concepts	✓					
Design within constraints	✓	✓				
Proper use of codes and standards in design		✓				
Able to demonstrate broader impacts of project (where applicable on society, economics, technical, environmental, safety)		✓				
Quality and functionality of working prototype	✓					
Delivery						
Use of vocabulary appropriate to technical subject and audience, clarity and confidence		✓				
Attire, posture and eye contact		✓				
Efforts of all group members/Group dynamics	✓					
Ability to effectively answer questions						
Quality/Readability of slides	✓					
Relevance of Slides – use of modern techniques i.e. video, animation, sound clips etc.	✓					

96

JT2

Converting a Mechanical Operated System to an Electronic Operated System

Team #4

Armand Feuba Baweu
Eulises Garcia Benito
Francisco Hernandez
Franky Williams Lonfo
Jacqueline Torralba

Instructor: Professor Turner
Team Sponsor: Professor Fuller
Team Facilitator: Professor Musa



1

JT3

Team #4



Scribe
Eulises Garcia (EE)



Data Analyst
Francisco
Hernandez(EE)



Team Lead
Jacqueline
Torralba(EE)



Test Lead &
Product
Specialist
Franky
Williams(EE)



Software Developer
Armand Feuba(CE)

2

JT1

Introduction

Problem Statement

Golf carts are used in many everyday settings, due to their compact size, and ease of use. Mechanical operated systems such as the mechanical shifter handles are prone to breaking. This issue leads an owner to additional cost for maintenance and potential unsafe situations.

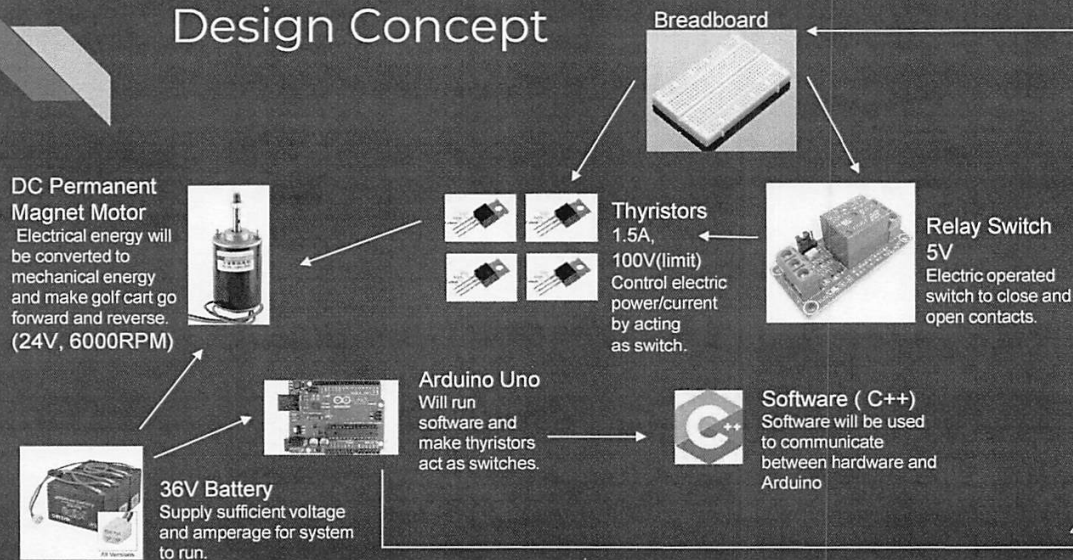
Objective:

The goal of this project is to change the mechanical operated system switch of a golf cart, and design an electric operated system switch. This will reduce maintenance required and help golfers conveniently and safely use the golf cart.

3

JT4

Design Concept



4

Acceptance Criteria

1) Embedded System:

- System must fit within the golf cart engine bay.
- System must be energy efficient and not consume a large amount of battery life
- System must have proper organized connections that can be identified easily.
- System software must communicate with the microcontroller to control the electronic switches.

2) Switch:

- Switch should make the golf cart go forward and reverse through the help of the electronic embedded system.
- Switch should be user friendly, and durable.
- Switch should run while other features of the golf cart are in use.

5

JT6

Marketing Requirement	Engineering Requirement	Justification
User friendly	Integrate electric switch into circuit correctly to control polarity contact	The switch will flip polarity contacts <i>by just a click</i> to make the golf cart move forward and backwards
Low cost	Use an affordable microcontroller	Maintenance's electronic or electric equipment is cheaper than the maintenance's of mechanical or mechanical's equipment
Use same battery source to power new control system	Arduino will use built in power source of golf cart	By not adding a new power source, will avoid unnecessary cost and materials to be used.
Electronic shifting requires less maintenance	By replacing a mechanical switch to an electronic switch that is controlled by an Arduino, the operated system will last much longer	Mechanical control switches are destined to eventually fail, while an electronic switch would last longer and be easier to change if needed
Low effort-shifting	Electronic shifting is faster than mechanical shifting based on the time response and the frequency of the data transmission	Response time: $0 < t < 1s$ $T <= 450ms$ (0.450s) $f = 16MHz$ Accel time responding is less than 1s on electronic devices compare to the load-bearing force of mechanical devices.

6

JT7

Project Impact Summary

Category	Project Applicability
Public Health, Safety, and Welfare	✓
Global	
Cultural	✓
Social	✓
Environmental	
Economic Factors	✓
Technical	✓

7

JT8

Project Impact - Safety

- Golf carts being are a popular mode of transportation in outdoor areas, an increasing level of nonfatal injuries are occurring.
- A study done from 1990 to 2015 "U.S. emergency departments visits for golf cart-related injuries tripled from 6,000 in 1990 to 18,000 in 2015".
- Of these incidents, 9.6% were when collision occurred with a vehicle or object and could be due to gear shifting issues.
- Having an electronic switch shifter would have less failure occurrence and lessen the number of cases.

Table 1. Primary causes of U.S. golf cart-related injuries

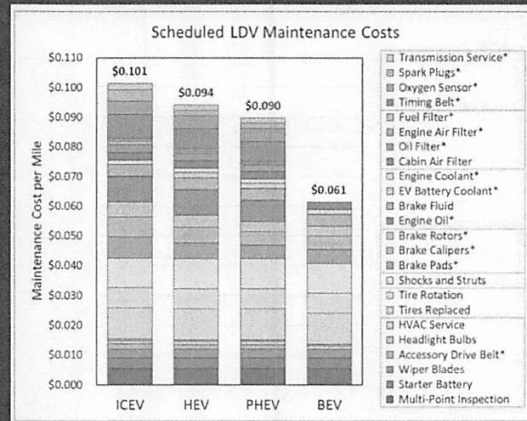
Cause of injury	Percentage of cases
Fell/jumped from cart	38.3
Struck/run over by cart	16.2
Collision with a vehicle or object	9.6
Cart overturned	8.9
Injury getting into or out of cart	4.9
Injury to protruding limb	3.2
Other/not specified	18.9

8

JT18

Project Impact - Economical

- Maintenance cost for electric vehicles (EV) is lower because of less moving parts:
 - no exhaust system
 - less need for cooling
 - less abrasive braking
- According to study by U.S. Department of Energy:
 - BEV (battery electric vehicle) are cheaper to maintain by \$0.06 per mile
 - ICEV (internal combustion engine vehicle) is \$0.10 per mile



ICEV (internal combustion engine vehicle)
BEV (battery-electric vehicle)

PHEV (plug in hybrid vehicle)
HEV (hybrid electric vehicle)

9

JT11

Project Impact - Cultural/Social

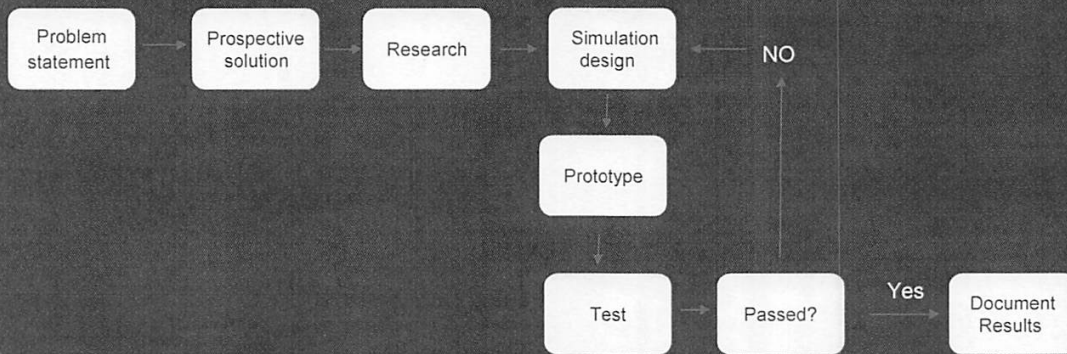
- 1.) Due to low effort-shifting elderly will still be able to drive golf carts with no problem.
 - There is a Village where most of the people are age 55+ and there is 65,000 golf carts reported in residence.
- 2.) Golf cart users will now be able to focus on enjoying the golf cart rather than getting the shifter fixed.
 - A Mechanical Shifter on Amazon has 65 reviews for one year. Therefore, we estimate that around 65 – 200 shifters were sold within that year.



10

JT12

Engineering Design Methodology



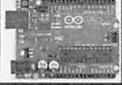
11

JT13

Constraints & Assumptions

- **Assumptions**
 - No time lag or transmission delay.
 - Linear and quick response and good accuracy
 - No entrainment or contamination in control medium
 - Integrated control system and easier interconnections.
 - Low Power re-equipment
 - Speed of response is substantially instantaneous.
 - Easy Maintenance and test kit re-equipment.
- **Constraints**
 - Complex Networks
 - Not possible for flame-proof areas
 - Skilled maintenance regulations
 - Expensive layout
 - Good and safe wiring layout required
 - Susceptible to line fluctuations of voltage and frequency

12

Project Comparison (Microcontrollers)				
Product	Pros	Cons	Cost	Reference
 Arduino Uno	- User friendly - More efficient within DC series motors	6 Analog inputs	\$23	"Arduino Uno REV3." <i>Arduino Online Shop</i> , https://store-usa.arduino.cc/products/arduino-uno-rev3?selectedStore=us .
 Arduino Nano	8 Analog inputs - Small profile	- Micro USB port - Requires other components	\$21	"Arduino Nano." <i>Arduino Online Shop</i> , https://store-usa.arduino.cc/products/arduino-nano?selectedStore=us .
 Arduino Mega	256 KB of flash memory - High I/O requirements 16 Analog Pins	- More costly - Big profile	\$41	"Arduino Mega 2560 REV3." <i>Arduino Online Shop</i> , https://store-usa.arduino.cc/products/arduino-mega-2560-rev3?selectedStore=us .
 Raspberry Pi 3	26 Analog Pins - Supports all types of codes - Faster Processor	- More expensive - Tends to overheat	\$85	<i>Amazon.com: Element14 Raspberry Pi 3 B+ Motherboard...</i> https://www.amazon.com/ELEMENT-Element14-Raspberry-Pi-Motherboard/dp/B07BDR5PDW .

13

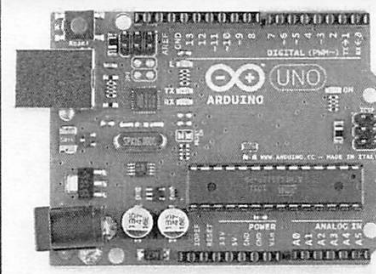
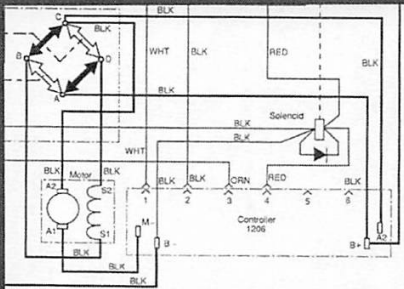
JT10

Project Impact - Technical

Based on the data analyst, low cost, safety improvement and low effort-shifting, we believe that controlling the golf cart by an electronic devices will make it cheaper and safe to operate compared to the mechanical operation which request a physical effort and load-bearing force applied on the armature.

B+ A D S2 S1 A C Armature A2 A1 = Forward
 B+ A B S1 S2 D C Armature A2 A1 =Reverse

00 Stop
 01 Motor forward
 10 Motor reverse
 11 Ambiguity



Inputs		Output
A	B	L
0	0	0
0	1	1
1	0	1
1	1	0

14

```

Team_1_senior_design_project_update$
const int pwm = 2 ;
const int in_1 = 10 ;
const int in_2 = 11 ;

void setup()
{
  pinMode(pwm,OUTPUT) ;
  pinMode(in_1,INPUT) ;
  pinMode(in_2,OUTPUT) ;
}

void loop()
{
  //For Clock wise motion , in_1 = High , in_2 = Low

  digitalWrite(in_1,HIGH) ;// digit 1 Golf cart will move Forward
  digitalWrite(in_2,LOW) ;// digit 0

  //Clockwise for 3 secs . the golf cart will wait for reversal phase
  delay(60000);
  //For brake
  digitalWrite(in_1,HIGH) ;// digit 1
  digitalWrite(in_2,HIGH) ;// digit 1
  analogWrite(pwm,400); // maximum speed of the system
  delay(1000) ;

  //For Anti Clock-wise motion - in_1 = LOW , in_2 = HIGH
  digitalWrite(in_1,LOW) ;// digit 0
  digitalWrite(in_2,HIGH) ;// digit 1 the golf cart will move on reverse
  delay(60000) ;

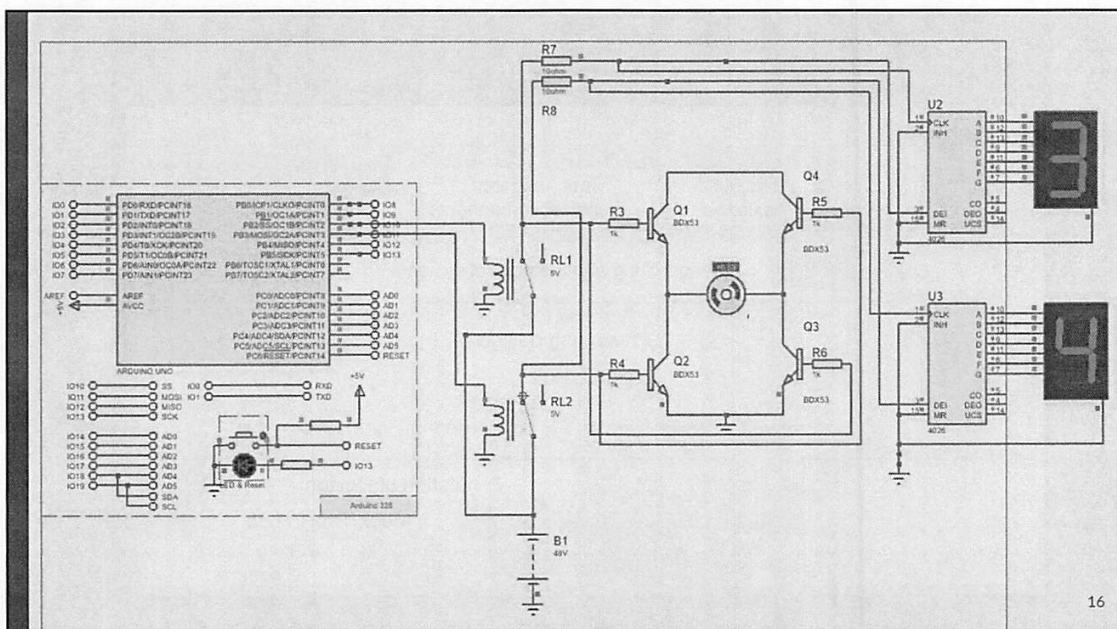
  //For brake
  digitalWrite(in_1,HIGH) ;// digit 1
  digitalWrite(in_2,HIGH) ;// digit 1
  delay(1000) ;
}

```

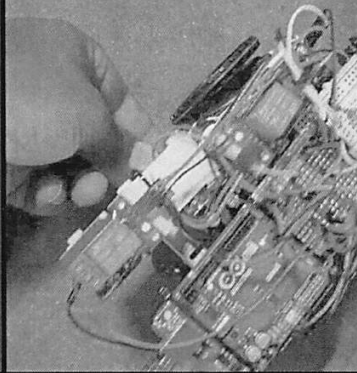
Done compiling.

Software and Circuit Schematic

15



What we have
accomplished
so far :



17

Project Schedule

Project Month	Aug	Sept	Oct	Nov	Dec
Stage 1: Project Research	Project Assigned	Cont. research of electrical components			
	Researching about electrical systems				
Stage 2: Project Design		Presenting design to advisor			
			Ordering Parts		
Stage 3: Testing			Simulation of Design		
				Mock Trial in Lab	
					Putting Design Together

18

References

JT15

"Electronic and pneumatic controls analyzed," *Bright Hub Engineering*, 28-Oct-2009. [Online]. Available: <https://www.brighthubengineering.com/commercial-electrical-applications/53898-pneumatic-vs-electronic-control-mechanisms/>. [Accessed: 04-Oct-2021].

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"Arduino Nano," *Arduino Official Store*. [Online]. Available: <https://store.arduino.cc/products/arduino-nano>. [Accessed: 04-Oct-2021].

"Arduino Mega 2560 REV3," *Arduino Official Store*. [Online]. Available: <https://store.arduino.cc/products/arduino-mega-2560-rev3>. [Accessed: 04-Oct-2021].

S. J. Chapman, *Electric Machinery and power system fundamentals*. Boston: McGraw-Hill, 2002.

19

Questions



20

Back Up

21

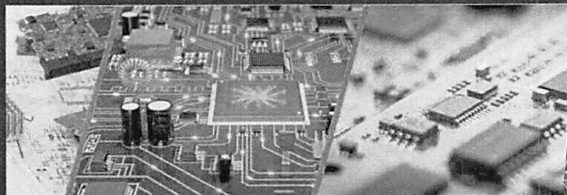
JT5

Prospective Solution

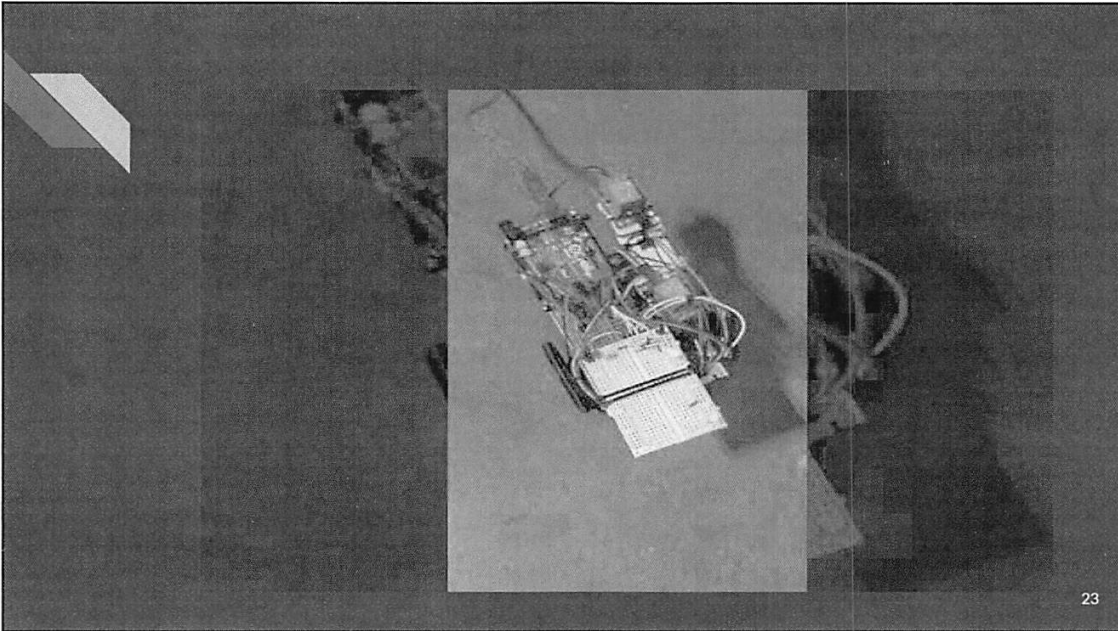
The using of advanced engineering technology on this project will change the concept and the future of the golf cart.

The implementation of Arduino microcontroller through the golf cart system will change the operation mode of the entire system and making easier for the golfer operator or owner to both operating and performing maintenance.

Engineering design approach will cover everything from analog and power, connectivity, display, lighting, processor, sensor and more.



22



ASSIGNMENTS FOR OUTCOME 3

**An ability to communicate effectively with a range of audiences
(Written Communication)**

Electrical and Computer Engineering

OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET

ELEG 4247 Sr Design and Professionalism I

FALL 2021

Instructor: Turner / Musa

Title of Assignment

Final Written Report

Outcome Measured Using this Assignment

Outcome 3

**An ability to communicate effectively with a range of audiences
(Written Communication)**

Check the communication problem characteristics related to this assignment

Ability to prepare an executive summary for the report	
Requires students to:	
	Prepare an executive summary of 5 to 8 pages – this is part of ELEG 4482 deliverable and taught in the Spring Semester
Ability to organize, plan and properly format a written technical report	
Requires students to:	
x	Organize report by chapters, major sections, subsections and paragraphs
x	Provide Title Page, and Table of Contents, list of Figures, and List of Tables properly formatted.
x	Provide figure and table numbers with titles and reference and discuss each table and figure in accord with standard practice.
x	Properly cite references in the report and provide well formatted reference list at the end.
x	Prepare the written report in accord with standard report formatting Manual
Ability to compose original texts and properly apply the conventions of written language.	
Requires students to:	
x	Properly apply capitalization, punctuation, and penmanship, to communicate clearly and spell proficiently,
x	Apply standard grammar and usage to communicate clearly and effectively in writing using complete sentences , good subject-verb agreement, pronoun referents, and parts of speech, properly using adjectives, adverbs, prepositional phrases appropriately, conjunctions to connect ideas to make writing vivid and precise, and use available technology to support aspects of creating, revising, editing, spell checking, and publishing the report.
Ability to provide appropriate discussion, conclusions and recommendations	
Requires students to	
x	summarize the goals, objectives, and indicate whether they were met.
x	summarize the report chapter by chapter
x	summarize constraints and codes and indicate whether they were met for design reports Summarizes how issues relating to public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors were considered/addressed for design reports.
x	Provide logical conclusions Provide logical conclusions and recommendations (including strengths and weaknesses)

Brief justification of the suitability of assignment for the outcome

The written final for ELEG 4247 will require the students to leverage their understanding of the design project and answer questions in written format. There are 10 questions on the assignment ranging from a clear/concise problem statement to project impact on Safety Environment, Society etc. Students also get a detailed

ELEG 4247 Senior Design

Fall 2021

Outcome 3 – Written

**PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING**



**Senior Design & Professionalism I
ELEG 4247 – P01**

Final Exam Report

Due Date Sunday November 28 by 5:00pm (Central Time)

Upload to Final Exam Written Report Assignment

Due date is firm: early is ok and late is (- 10 points)

Submit to me a word document – do not send me a PDF or PowerPoint

This document will serve as your final exam report

Instructions:

- Avoid unexplained acronyms
- Word Document Only – No PDF or other formats
- Number all pages
- OK to use diagrams or pics but they must be explained clearly

1. What is your team trying to solve/accomplish as part of the Senior Design project? Provide a clear and concise problem statement. [5 points]
2. Why is your project important? Clearly state its broader safety/environmental/technical/societal/economic impacts. [20 points]

Safety – Does the project improve or impact safety in anyway.

Environment – Does the project help the environment in anyway.

Technical – Any new technical or innovation concepts from your project

Society – Does your project help society in anyway (cultural impact)

Economic – Does your project more cost effective, saves money or time

3. What are the major goals or key deliverables of your project? List the marketing and engineering design specifications or 1:1 solution matrix of your proposed solution. What are your design constraints? [10 points]
4. What is your proposed solution? Please provide a detailed explanation of your proposed solution. [5 points]
5. How did your team arrive at your proposed design? You must show any math or engineering analysis used to guide your design proposal. Which courses in your academic program helped you the most in this specific design project? Explain. Were new skills required? If yes, how did your team members acquire them or planning to acquire them? [10 points]
6. What is the competitive advantage of your proposed solution (preliminary design concepts)? Briefly list the advantages and disadvantages of your proposed solution by comparing it with other competing or commercially available solutions/products. Please include your product comparison. [20 points]
7. (a) Provide a brief project status update. What your team has accomplished so far? (b) Include a project timeline showing key milestones for rest of semester and those needed to complete your project my end of April 2021. [10 points]
8. How did you perform your literature review? Provide a list of your pertinent references. Provide in the proper format a list of all references as part of your literature review. [5 points]
9. Do you anticipate any issues in implementing your proposed design solution successfully in a timely manner? If yes, how do you intend to overcome those obstacles? [5 points]
10. Cover Page, Technical Write Up, Grammar, Format, Graphs, Pics, Diagrams, number pages [10 points]
11. **Optional Extra Points:** Define or describe what is a discretionary project and a non-discretionary project [5 points]

➔ **Format – start each section with the question being asked. Double space. Font size 12 or 14. (Must be large enough to read) Please use/include charts and graphs to explain or answer. No page limit.**

1. What is your team trying to solve/accomplish as part of the Senior Design project? Provide a clear and concise problem statement. [5 points]

(Enter your response.....)

Written Communications Evaluation Form
ECE Senior Design & Professionalism
Written Communications-Outcome 3

Title of Presentation: ELEG 4247 Fall Final Written Report						
Team Number and Members: Team 1						
Date of Presentation: 11 - 28 - 21						
Name of Evaluator and Affiliation (University or Company name) VST						
	Excellent 99	Very Good 89	Average 79	Below Avg. 69	Poor 54	Comments
Executive Summary						
Able to prepare an executive summary for the report	N-A					
Format						
Able to organize the report e.g. Title Page, and Table of Contents, list of Figures, and List of Tables properly formatted	N-A					Very good/ Excellent Report
Charts and Graphs in the report are well documented, easily understood and referenced appropriately	✓					
Able to show appropriate discussion, conclusions and recommendation	✓					
Able to cite references in the report and provide well formatted reference list at the end	✓					
Able to prepare the written report in accord with the Senior Projects Report Manual and instructor guidance	N-A					
Written Language						
Able to write the report without grammatical errors	✓					Small adjustments + minor comments to improve
Report includes appropriate level of detail and analysis	✓					
Able to write the report in excellent professional style – no unexplained technical jargon or acronyms	✓					
Apply approved standard method to cite references used and in literature review	✓					
Conclusion and Recommendation						
Able to summarize goal objective and indicate if they are met	N-A					

N/A = Evaluation in Spring
Final Report

Score = 99%

PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING



Real-Time Crowd Detection System using Raspberry Pi and Deep Learning

ELEG 4247: Senior Design & Professionalism I

Topic: Final Written Report

Team Number 1

Submitted by:

Deonna London
Jalyn Beaty (Team Lead)
Gabriel Maxwell
Alexis Hunter
Alyssa Reed

Instructor: Professor Turner

Due Date: Sunday, November 28th by 5:00pm

Date of Submission: Sunday, November 28th

*Report
Grade = 100%
Xtra
Credit = 5 pts*

Overall a very good report. Some minor comments included - one thing you might consider is ~~using~~ using a similar style for Project Comparison like you did for Marketing/Matrix section.

What is your team trying to solve/ accomplish as part of the Senior Design project? Provide a clear and concise problem statement. ✓

According to the World Health Organization, the risk of catching COVID-19 is higher in crowded and inadequately ventilated areas. As of September 2021, Harris County is at a level one (severe) threat level. Level one signifies the spread of COVID-19 is uncontrolled; outbreaks are worsening. The 7 day average of new cases is 125.85 per 100,000. Figure 1 shows the sum of new cases reported in the past 7 days based on the population. Where the graph exceeds the 100 threshold, it reflects red severity. Where it exceeds the 50 threshold, it reflects orange severity. Where it exceeds the 10 threshold, it reflects yellow severity. Harris county has been in the red and remained in the red as of the end of July 2021. Without proper social distancing being enforced, COVID-19 and the consequences that come with it will continue to impact the world.

next time define red/orange severity meaning?

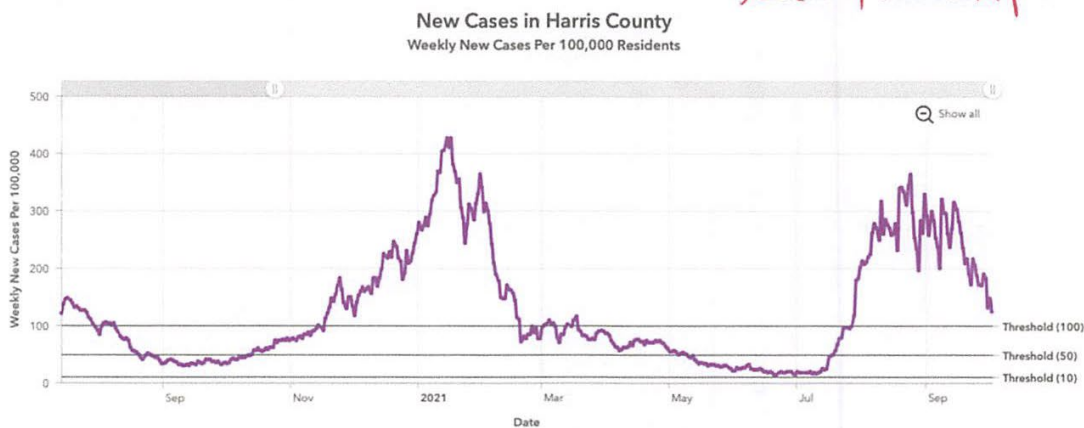


Figure 1

What is your proposed solution? Please provide a detailed explanation of your proposed solution.

The proposed solution is to design a real-time crowd size detection device with an alarm

Components

system using Raspberry Pi 3 B+ and other compatible attachments. The attachments would include a camera for video and image processing, a sound alarm to alert those in the room and include the blind, and a light alarm to include those who are deaf. The Raspberry Pi will serve as the brain of the system as it will be programmed to scan frame-by-frame live video and use TensorFlow and OpenCV to perform object detection. Using deep learning, the system would be able to not only keep track of how many individuals are in a room, but determine how far apart they are as well. If any requirements are not met the system would then send a signal to sound an alarm until the violation is corrected.

✓
Good
Z

Why is your project important? Clearly state its broader safety/ environmental/ technical/ societal/ economic impacts.

Excellent Summary + Reference of Figures

After researching and truly diving into this project, our team decided that our project is important because it impacts health, culture, society, and the economy. We will first discuss how our project impacted public health, safety and welfare. As of September 2021, there have been about 230 million positive COVID 19 cases around the world. The pandemic has made day to day activities such as class, work, or even the grocery store a real health risk. Figure 2 is a linear representation that shows how the number of positive covid cases have drastically multiplied from Jan 2020 to Sept 2021. Our project will help to reduce the number of positive COVID cases by monitoring spatial issues and preventing gatherings that are too large. It will force users to adhere to CDC guidelines and maintain a minimum of 6 feet apart.

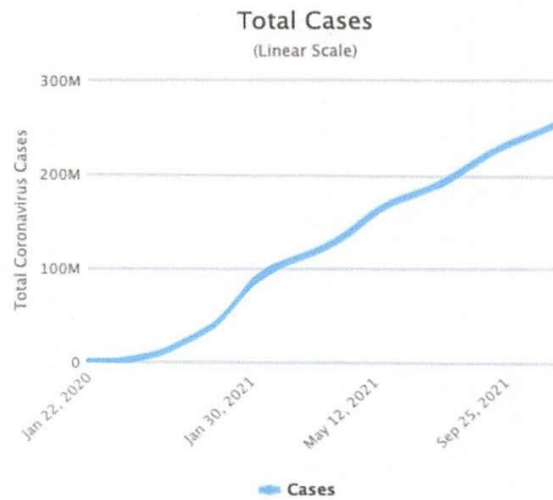


Figure 2: Positive COVID cases

At COVID 19's peak, 90 percent of countries closed their World Heritage site according to a World Bank article. Places such as museums, libraries, churches and art galleries have been closed. Due to these businesses being shut down, they have lost money and now it is no longer an option for them to reopen. COVID has changed the way populations not only go to class, work or the grocery store but the way we go to school, interact with society, entertain ourselves and spread our traditions. ~~*~~ Figure 3 shows the loss of revenue reported by 981 cultural organizations. The higher the loss of revenue, the more likely the business will have to shut down. Our device will help reopen these organizations. Creating and launching this device will reduce the number of COVID cases and make it less likely that businesses have to close.

** = Could consider starting a new paragraph - and putting comments along w/ figure on same page. Nothing wrong how you did it but * might make it more professional looking & easier to read.*



Figure 3: Loss of Revenue

The number of adults attempting to get a divorce has risen by 34 percent since 2019. The percentage has risen due to couples being stuffed in the house together which forced them to realize things about one another that they didn't know before. Couples have also disagreed more on parenting decisions. According to the Center for Disease Control and prevention (CDC), “teens and adolescents' social, emotional and mental well-being have been impacted by the pandemic”. Figure 4 displays the results of a survey based on responses from 977 parents with teens aging from 13-18 years old. Anxiety, Depression, Sleep issues, withdrawal, and aggressive behavior are effects brought along by COVID isolation. With the use of our device people will once again be able to meet in group settings. Our device will ensure individuals are able to receive the necessary socialization while not endangering their health or the health of those around them.

*- see comment p93

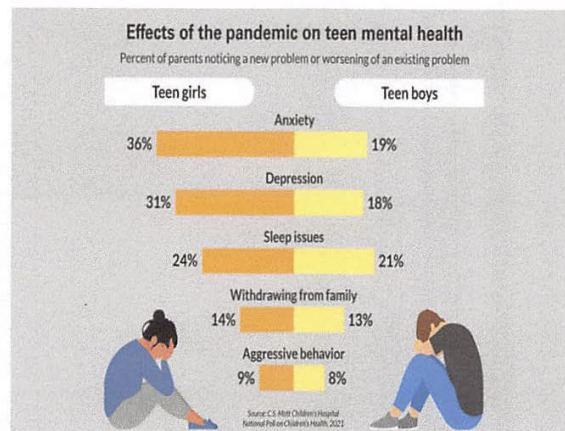


Figure 4: Survey Results

Our economy took a major hit during the pandemic. In 2020, the Gross Domestic Product (GDP) has decreased by 3.5 percent which is the lowest it has been since 1946. The average unemployment rate in 2020 was about 8 percent higher than the annual averages during the Great Recession in 2009. ^{*}Figure 5 shows the quarterly unemployment rate from 1968 to 2020. As you can see, in 2020 the unemployment rate reached 13 percent. Our project will mend our economy by reducing the spreading rate of COVID 19. Reducing the number of COVID cases will lead to businesses being able to reopen, thus jobs being available to those in need. After jobs are secured as normal, our unemployment rate and GDP will increase.

** see comment pg 3*

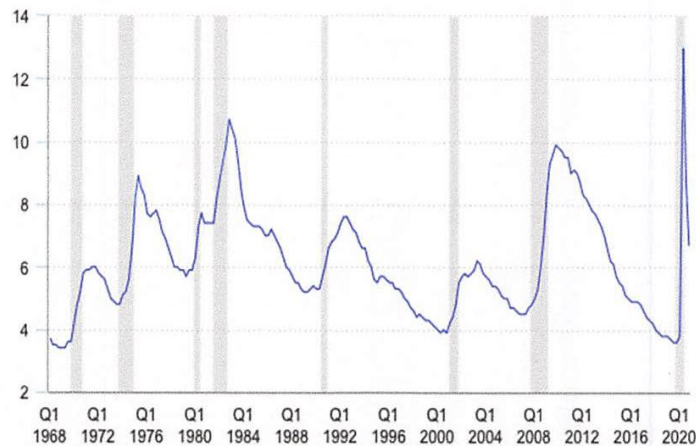


Figure 5: Quarterly Unemployment Rate

What are the major goals or key deliverables of your project? List the marketing and engineering design specifications or 1:1 solution matrix of your proposed solution. What are your designed constraints? [10 points]

Key Deliverables

Very Good - I appreciate how you explained each deliverable!!

Our project has 5 major goals/ key deliverables.

1. We will incorporate object detection. Object detection will allow us to identify and locate objects in each frame.
2. We will incorporate a people counter. Incorporating a people counter will allow us to monitor how many people are located in a room.
3. Perform crowd detection. Crowd detection utilizes object detection and a people counter to monitor the amount of people in a given area and give a notification when capacity has been reached.
4. Our device will incorporate a sound alarm. After utilizing crowd detection, when capacity

has been reached, an alarm will sound.

5. We will incorporate a light alarm. After utilizing crowd detection, when capacity has been reached, along with the alarm being sounded, a light will come on.

Marketing and Engineering Design Specifications

Marketing Requirements	Engineering Requirements	Justification
Fit in the top corner of a room facing the door	Raspberry Pi - 85x56x17mm Camera Board v1.3 - 20x25x9mm sound and light alarms	Device will need to take up minimum space
Facial recognition	Open Source Computer Vision Library (OpenCV)	Misidentified objects could result in inaccurate assumptions; false alarms
Light alarm system	Red light remains on until the spatial issue(s) are resolved Epilepsy Seizure Sensitive	Accessible for deaf while taking in account of other safety risks 5-30 flashes per second may cause seizures
Sound alarm system	Concealed Adjustable volume (40-80 Decibels)	Accessible for blind
Should be able to keep count of people in a given area	Create people tracker using: Python OpenCV Object tracking Algorithms	Count of people in a given area needs to be kept in order for the alarms to sound at the correct times
Distance detection between people in a given area	HC-SR04 Ultrasonic Sensor (2mm - 4m)	Device must be able to detect violation
All added parts and enhancements compatible to computed device	Camera Board v1.3 compatible with Model B	Parts need to be compatible to the Raspberry Pi 3 B+ in order for them to

		be programmed
Reliable and consistent	Test trials and Result Analysis 1080p	Unwarranted alarms can be alerted

Figure Number ?

1. The detection system will be designed to fit in the top corner of a room, facing the door.
The position of the system affects the accuracy of the results. We want to design it to take up as little space as possible and to have easy mobility.
2. Our system will be able to recognize the difference between a human face and an inanimate object. Misidentified objects could result in inaccurate assumptions and false alarms. To achieve this we will use object detection in our software programming.
Object detection is finding out what and where multiple objects are in an image. It is a combination of image processing and computer vision. There are a variety of libraries in deep learning and python to incorporate object detection. We will be using Open Source Computer Vision Library (Open CV) and TensorFlow. OpenCV is a library of functions aimed at real-time computer vision and TensorFlow is a framework for machine learning. Both have their pros and cons like any other technique, but together they align well for our object detection programming.
3. We want our system to be accessible for those who are deaf. We will incorporate a light alarm system; Those that cannot hear the alarm, can see the alarm. The light will be a red light because red is known to be an attention getting color. Our team has researched and learned that those with epilepsy are more likely to have seizures with lights that flash between 5 and 30 times per second. In order to incorporate the safety concerns of all our

users, our light will not flash. The light alarm will come on and remain on until the issues are resolved.

4. Our alarm system will also have an accessibility option for those who are blind. We will incorporate sound so those that cannot see the alarm, can hear it. Our team would like the volume to be adjustable, so that it serves the needs of whoever is using it. We wouldn't want our alarm to be incorporated in a house and sound as a fire alarm. It would be between 40-80 decibels.

5. A main function of our system will be for it to keep count of the amount of people in a room. To do this we will be using OpenCV and Python. We will add object tracking to our already incorporated object detection to create the most efficient people tracker.



Object tracking takes coordinates of where an object is in an image and assigns an ID to that object. It tracks this ID as it moves in a stream predicting the new location it will have in the next frame, based on its previous location. The two together will incorporate two steps to perform the function. First, it will detect what new objects enter. Then, these objects will enter the tracking phase where they are traced throughout various frames. These two phases of detecting and tracking will continue to run, and when going back into the detecting phase some objects that were lost could be found.

6. Our other function of the system is for it to be able to detect distance between objects in a given area. For this we will be using an ultrasonic sensor that is able to detect the proximity between people. This sensor would be able to use object detection and tracking to see where all objects are and then measure the distance between the bounding boxes they create when they are identified.

*Good Explanation of Matrix -
EASY for someone unfamiliar
to understand -*

7. In order for our device to be able to work properly, all of the parts that we attach to the device need to be compatible with the Raspberry Pi 3B+. So far we know we will be using Camera Board v.1.3 which is compatible with Model B of the Raspberry Pi. Any other attachments like the sensors, light and sound alarm will be compatible as well.

Assumptions

1. The area in which our system is located isn't too loud. To be deemed successful, we want to assume that when our system is sounded, the sound of its surroundings is not louder than our alarm system.
2. Those involved are aware of the system and its purpose. What good is a working project if nobody knows its purpose?
3. Participating parties don't enter in groups. For the best results, we want to ensure that our count is accurate. To be as accurate as possible, we would need participants to enter one by one to ensure our system can catch the face and body of each participant.
4. An alert will sound when a violation occurs. We assume our system will do what it was designed to do. When a violation occurs, we want users to be notified by both sound and light.
5. Our system will monitor the amount of people entering the room as well as any spatial issues that occur. This is another main goal for our project. If it does not monitor the amount of people in an area then it cannot be deemed a successful project.

Constraints

1. Our system will require a strong wifi signal to function. Our raspberry pi must be connected to wifi to maintain the proper date and time. We also need wifi to be able to

send out the alerts.

2. Our camera has to be in a position that can catch people of varying heights. If the camera is too high or too low then we won't be able to catch every user. Missing count decreases our accuracy.
 3. A constant power supply is required for our system to function. Our Raspberry Pi must be plugged in at all times to complete the necessary tasks. If there is no power, there is no functionality.
 4. The room dimensions must be known and inputted by the user. In our program, we will ask the user to input the dimensions of a room. We ask for this information to help set the capacity of each room. Knowing the dimensions will allow us to have an idea of how many users can fit into that given area while adhering to CDC guidelines.
 5. Once the camera is mounted, it cannot be easily moved. Due to the wiring and set up of the device, moving it will not be easy.
 6. Raspberry ^{Pi} requires an external monitor. Raspberry ^{Pi} is a computer. It will require a monitor to complete user interfacing and also to display frames and current participant counts. *you should use uppercase P*
- Be consistent*

How did your team arrive at your proposed design? You must show any math or engineering analysis used to guide your design proposal. Which courses in your academic program helped you the most in this specific design project? Explain. Were new skills required? If yes, how did your team members acquire them or planning to acquire them?

In order to get to the point in our project where we had a proposed design we started by developing a plan for the hardware aspect and the software aspect. For the hardware portion of our project we knew we would have to work with a Raspberry Pi 3 B+. This is the main

↑ correct see comment above

component of the hardware design of our project. Since this is the heart of our project we took our Raspberry Pi and worked from there. We knew that we would need the basic hardware: mouse, keyboard, and a monitor, but we also had to incorporate other hardware components into our device to ensure that we satisfied all of our marketing requirements. These pieces of hardware consisted of a speaker that was able to reach our volume parameters (20-40 decibels) and a light component that was bright enough to catch the attention of our audience. Once we assemble all of our hardware components we are going to 3D print a housing unit that holds all of these pieces together to make our product much more aesthetically pleasing. We needed to incorporate a little bit of old knowledge and a little bit of new knowledge to assist us in our design process. Intro to Electrical Engineering helped us a lot with the hardware piece of our project. We know that we might have to utilize a breadboard in our final product to connect our LED to which we learned how to do in that class but as far as the software is concerned none of our team members knew how to code in Python so we all had to learn lots of new coding techniques to help get us to where we are now. Based on one of our group members previous internship experiences we were able to use her knowledge to navigate through and use the Linux terminal which helped a lot in the installation process and the beginning of our coding process.

To understand the software portion of our project one must understand the basics of identifying objects through computer programming. The base is object localization. This is finding out what and where a single object exists in an image. An advanced version of this is object detection. This is finding out what and where multiple objects are in an image. This combined image processing and computer vision. Object detection is the ground of our project. This is made possible by downloaded libraries called python programming, two of the most important being Open Computer Vision and Tensorflow. In our case, the way it works is by

training the device to distinguish between people and other objects. Figure 6 shows object detection successfully running on our Raspberry Pi device. The next step is to get our device to identify and keep count of the amount of people in a space with specific borders. After this we can implement the distance detection programming onto our device.

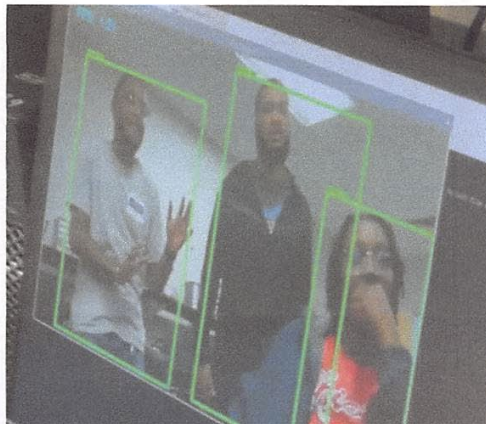


Figure 6: Object detection

*Good
Addition
of work done
so far!!*

What is the competitive advantage of your proposed solution (preliminary design concepts)? Briefly list the advantages and disadvantages of your proposed solution by comparing it with other competing or commercially available solutions/products. Please include your product comparison.

There are other products on the market for enforcing social distancing. Figure 6 shows the comparison of 3 other products in relation to ours. There is a Geovision People Counter device that is used to keep count of how many people are in a given space. Though this meets one of the requirements of our device, it does not meet the distance detection also provided by our device. The Geovision People Counter may be able to count the number of people in a room, but it won't tell you how close those people are. A critical part of social distancing is

staying 6 feet apart. The price of this device is also higher than ours. Another device created for social distancing purposes is the Ultimaxx wristband. This is a watch-like device that will sound off when one user comes within 6 feet of another user. This device relies on battery life and will only work if there are 2 of them active. If an office used these for their employees, they would have to buy one for each participant, which could result in a high cost. This device is also limited to the willingness of a person. If someone chooses not to wear it, much like people choose not to wear a mask, then they are not going to be aware or abide by social distancing rules. Our device will be stationed in a room and anyone who enters will be detected and monitored for violations. The last product found is a tool used in iOS called the Magnifier Tool. This is a software used by apple users that can be programmed by the user to sound or alert when they are within a specific distance of something else. This tool has some of the same constraints as the Ultimaxx Wristband as far as participation. It also has its own con of accessibility as it is only for iOS users and not easily programmable to the average person. Below in Figure, is a chart that depicts these different products in comparison to ours, the Covid-19 Crowd Detector.

Product	Design	Pros	Cons	Cost	Reference	Final Decision
 Covid-19 Crowd Detector	Room camera for social distance	-Counter -Distance detection -Sound alarm -Light alarm	-Require measurement of dimensions beforehand	\$150	http://pc.ruk.pl/supply.com/products/rogozka-ry-pl-camera-board-v1-3-5mp-1080p	✓
 Geovision 84-PC2101T-0010 GV-3D People Counter	Camera Device used to count and analyze passing people	-Counter -Low power consumption -Lightweight	-Does not have a power adaptor included -Price -No distance detection	\$280	https://www.123securityproducts.com/84-pc2101t-0010.html	✗
 Ultimaxx Wristband	Wristband with 6ft detection	-Size -Portability -App compatible	-Relies on battery life -Only works with 2 -Limited to participation	\$20-40 per unit	https://www.amazon.com/Electronic-Social-Distancing-Wristband-Proximity/p/B08B100B7Y	✗
 Magnifier Tool	App used to identify objects and their distance	-Price -Audio and visual readout	-No android users -Limited to participation	Free for iOS users	https://www.imore.com/iphone-12-pros-people-detection-accessibility-feature-perfect-social-distancing	✗

Figure 6 Product Comparison

Figure 6: Product Comparison

Would be good
to adjust page
break & so this
is on page
w/ figure

(a) Provide a brief project status update. What has your team accomplished so far? (b)

Include a project timeline showing key milestones for the rest of the semester and those needed to complete your project by the end of April 2021.

As of November 19, 2021, We found an open-source code to assist us in coding our machine to run the crowd detection software successfully. The code is successfully running and is used to help our Raspberry pi and camera distinguish between people entering and exiting the camera's view; it also counts the people entering and leaving the room that leaves a timestamp in a separate window. In the upcoming weeks, we will perfect the code by researching different methods for the camera to differentiate between people and non-human objects. We also will be creating an alarm system by using led lights and an audio speaker. We will connect the newly created alarm system to the raspberry pi and incorporate a new code that activates the alarm system when a violation occurs per CDC guidelines. We have spent a total of \$290 of our ~~600~~^{\$600} dollar budget, so we are under budget. We are projected to finish our alarm system a month earlier due to our parts coming faster than expected, and our team plans on working during Christmas break, which can have us finish by the end of March.

Be
consistent

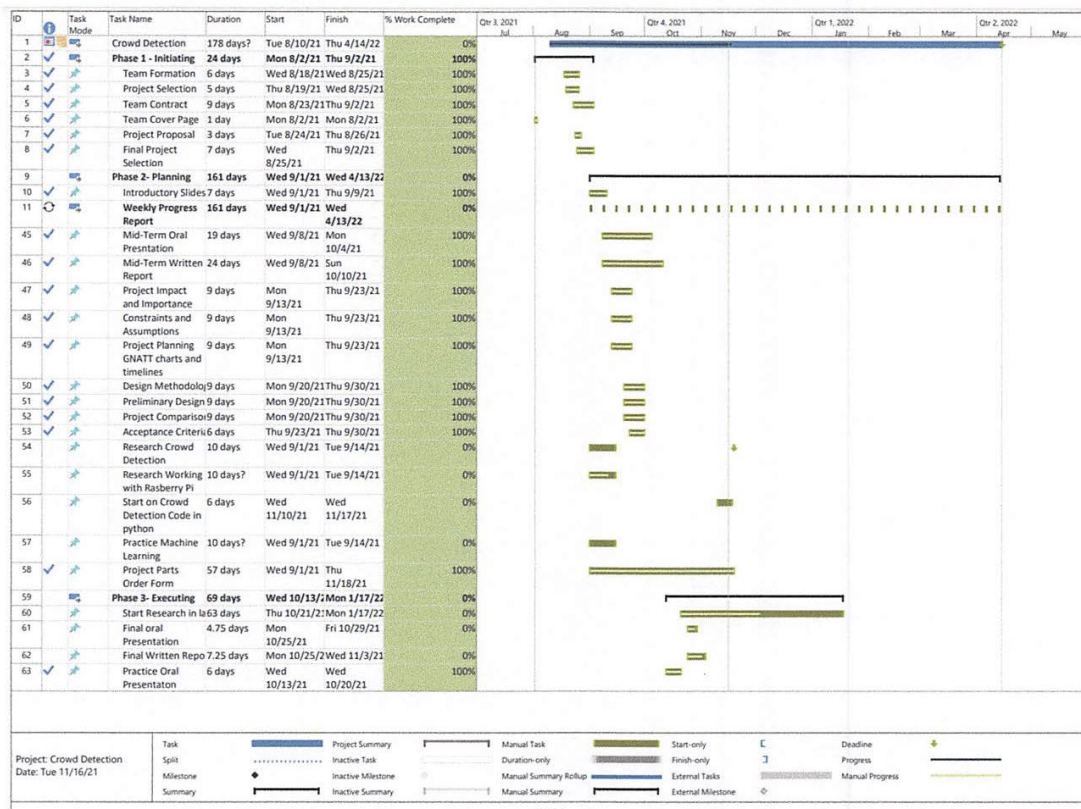


Figure 7 Gantt Chart

Do you anticipate any issues in implementing your proposed design solution successfully in a timely manner? If yes, how do you intend to overcome those obstacles?

We have encountered plenty of issues that could affect our completion of this project by our given deadline but we are working through these issues everyday and coming up with new ways to overcome these obstacles. Some of these obstacles consist of overclocking our CPU, having trouble finding adequate code to satisfy our project requirements, out of date software and many other issues. Even though we keep hitting roadblocks we find a way to push past these

obstacles everytime through thorough research and trial and error. Therefore while yes we might run into some issues we fully intend on working through them and getting our project done in a timely manner.

Optional Extra Points: Define or describe what is a discretionary project and a non-discretionary project.

✓ A discretionary project is a project a company assigns and chooses to implement with choice. A non-discretionary project is a project that is mandatory to complete by the company. They have no choice.

OK
✓ **How did you perform your literature review? Provide a list of your pertinent references.**

✓ **Provide in the proper format a list of all references as part of your literature review.**

Our team performed literature reviews by simply typing what we needed to know in google then by going site to site fact checking all information we discovered.

Resources

- "Coronavirus Cases." *Worldometer*,
https://www.worldometers.info/coronavirus/?utm_campaign=homeAdUOA%3FSi.
- Covid-19 parental resources kit – adolescence. (2021, July 27). Retrieved October 04, 2021, from

<https://www.cdc.gov/mentalhealth/stress-coping/parental-resources/adolescence/index.html>

- Culture in the COVID-19 recovery: Good for your wallet, good for resilience, and good for you. (n.d.). Retrieved October 04, 2021, from <https://blogs.worldbank.org/sustainablecities/culture-covid-19-recovery-good-your-wallet-good-resilience-and-good-you>
- "Harris County / City of Houston Covid-19 Data Hub." *Harris County / City of Houston COVID-19 Data Hub*, <https://covid-harriscounty.hub.arcgis.com/>.
- NBC Chicago. (2020, June 23). What are the odds someone at a gathering has covid-19? Chicago health officials break down the math. Retrieved October 04, 2021, from <https://www.nbcchicago.com/news/local/what-are-the-odds-someone-at-a-gathering-has-covid-19-chicago-health-officials-break-down-the-math/2294188/>
- Olson, P. (2020, May 15). Don't stand so close to me: Ai cameras police social distancing at work. Retrieved October 04, 2021, from <https://www.wsj.com/articles/dont-stand-so-close-to-me-ai-cameras-police-social-distancing-at-work-11589452202>
- Rosner, E. (2020, September 02). US divorce rates skyrocket amid covid-19 pandemic. Retrieved October 04, 2021, from <https://nypost.com/2020/09/01/divorce-rates-skyrocket-in-u-s-amid-covid-19/>
- Saladino, V., Algeri, D., & Auriemma, V. (2020, October 2). The psychological and social impact of covid-19: New perspectives of well-being. Retrieved October 04, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7561673/#!po=12.2642>
- State of the US economy: GDP, unemployment, Jobs & More: 2021 State of the union facts. (2021, April 22). Retrieved October 04, 2021, from https://usafacts.org/state-of-the-union/economy/?gclid=CjwKCAjw4qCKBhAVEiwAkTYsPFMgXd_vhlkd1arBJjHSS5kjdLP5wQZxKfkG5hl4GkeeHabrl9KFGfxoC16cQAvD_BwE
- Jay, et al. "OpenCV People Counter." PyImageSearch, 13 July 2021, <https://www.pyimagesearch.com/2018/08/13/opencv-people-counter/>.
-

ASSIGNMENTS FOR OUTCOME 4

An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Electrical and Computer Engineering
OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET
ELEG 4247 – Sr Design and Professionalism I
FALL 2021

Instructor: Turner / Musa

Title of Assignment

Ethics Exam

Outcome Measured Using this Assignment

Outcome 4

An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Requires students to	
x	Recognize ethical and professional responsibilities in engineering situations involving global, and societal contexts
x	Make informed judgements on ethical and professional responsibilities in engineering while considering the impact of engineering solutions in
	global context
	economic context
	and societal context.

Brief justification of the suitability of assignment for the outcome

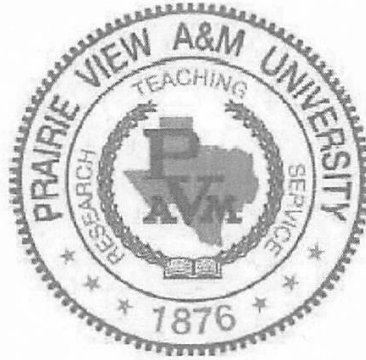
This lecture and associated test will ensure students understand expectations and engineering code of ethics. We have questions about certain ethical situations, and also questions on the engineering cannons. These all reinforce the necessary understanding for Engineering morals and code of operations

13 min **ELEG 4247 Senior Design**

1 min **Fall 2021**

10 min **Outcome 4 - Ethics**

**PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING**



**Senior Design & Professionalism I
ELEG 4274
(ABET Outcome 4 – Criteria 1)
Engineering Ethics Assignment**

What Team Are You on ____

Name: _____

Please write legibly. If I can't read it, I can't grade it.

Ask me if you want me to look up the spelling of a word for you.

This is an Ethics assignment - do not look at your phone or laptops.

Time limit = 30 minutes

Describe or Define or tell me what are Ethics? (5 points)

Why are Engineering Ethics Important? (5 points)

**Name a warning sign that you might be on Ethical “thin ice”?
(5 points)**

**What should you do if you have an engineering ethical concern on
a project you are working on? (5 points)**

NAME:

TEAM

Ethical Scenario Case Study (30 points)

A chemical company develops a new process that has a waste by product. Their internal studies show this by-product is carcinogenic (could lead to cancer). However, the by-product is not on a government list of banned chemicals because it is new and so dispose of it together with non-carcinogenic by products.

Describe the ethical responsibilities and considerations for this scenario.

Tell me the implications of this decision on society and economics of the project.

What are the possible ramifications to those who made the decision to dispose of the waste by product with no carcinogenic product?

For questions 1 to 10, indicate if the statements are true or false (circle the ones that apply) 5 points each

1. The term "professional engineer with a license" shall mean any person practicing or offering to practice engineering that has received a license from a Professional Board of Engineers and is otherwise in good standing with a Professional Board of Engineers.

True False

2. Professional engineer with a license may perform services only in the area of their competence.

True False

3. Professional engineer with a license may affix their signatures or seals to plans or documents dealing with subject matters in which they lack competence.

True False

4. The requirement for continuing professional development for professional engineers is intended to protect the public by reinforcing the need for lifelong learning in order to stay more current with changing technology, equipment, procedures, processes, tools, and established standards.

True False

5. It is acceptable for a professional engineer with a license to make slight exaggerations about his/her professional qualifications in advertising materials.

True False

6. Professional engineer with a license cannot accept compensation from more than one party for professional services on the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties.

True False

7. Engineers may perform services outside of their areas of competence as long as they inform their employers or clients.

True False

8. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employers or clients and such other authority as may be appropriate.

True False

9. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.

True False

10. Engineers may not participate in any matter involving a conflict of interest if it could influence or appear to influence their judgement or the quality of their services.

True False

**PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING**



100%

**Senior Design & Professionalism I
ELEG 4274
(ABET Outcome 4 – Criteria 1)
Engineering Ethics Assignment**

What Team Are You on 1

Name: Jalyn Beaty

Please write legibly. If I can't read it, I can't grade it.

Ask me if you want me to look up the spelling of a word for you.

This is an Ethics assignment - do not look at your phone or laptops.

Time limit = 30 minutes

Describe or Define or tell me what are Ethics? (5 points)

Ethics is a code or system of rules defining moral behavior.

Why are Engineering Ethics Important? (5 points)

Engineering Ethics are important because not only is it what we stand on and pride ourselves in, ethics keeps everyone safe and aids in making the correct decision.

Name a warning sign that you might be on Ethical "thin ice"? (5 points)

A warning sign would be if you catch yourself saying "well, maybe just this once...".

What should you do if you have an engineering ethical concern on a project you are working on? (5 points)

If you have an ethical concern then you should ask either your superior or the ethics department about it.

NAME: Jalyn Beatty

TEAM 1

Ethical Scenario Case Study (30 points)

A chemical company develops a new process that has a waste by product. Their internal studies show this by-product is carcinogenic (could lead to cancer). However, the by-product is not on a government list of banned chemicals because it is new and so dispose of it together with non-carcinogenic by products.

Describe the ethical responsibilities and considerations for this scenario.

This scenario is potentially legal but not ethical. It is the engineers ethical responsibility to report this problem. The CEO of the company should consider notifying the government of these findings.

Tell me the implications of this decision on society and economics of the project.

Societal Impact: Cancer is being spread through the environment.

Economic Impact: It might cost the company more money on the front end but if not reported it will cost not only a lot more money but your reputation will also be on the line.

What are the possible ramifications to those who made the decision to dispose of the waste by product with no carcinogenic product?

This decision could cause future legal problems, financial problems, and potential jail time.

For questions 1 to 10, indicate if the statements are true or false (circle the ones that apply) 5 points each

1. The term "professional engineer with a license" shall mean any person practicing or offering to practice engineering that has received a license from a Professional Board of Engineers and is otherwise in good standing with a Professional Board of Engineers.

☒ True

☐ False

2. Professional engineer with a license may perform services only in the area of their competence.

☒ True

☐ False

3. Professional engineer with a license may affix their signatures or seals to plans or documents dealing with subject matters in which they lack competence.

☐ True

☒ False

4. The requirement for continuing professional development for professional engineers is intended to protect the public by reinforcing the need for lifelong learning in order to stay more current with changing technology, equipment, procedures, processes, tools, and established standards.

☒ True

☐ False

5. It is acceptable for a professional engineer with a license to make slight exaggerations about his/her professional qualifications in advertising materials.

☐ True

☒ False

6. Professional engineer with a license cannot accept compensation from more than one party for professional services on the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties.

☒ True

☐ False

7. Engineers may perform services outside of their areas of competence as long as they inform their employers or clients.

☐ True

☒ False

8. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employers or clients and such other authority as may be appropriate.

☒ True

☐ False

9. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.

☒ True

☐ False

10. Engineers may not participate in any matter involving a conflict of interest if it could influence or appear to influence their judgement or the quality of their services.

☒ True

☐ False

ASSIGNMENTS FOR OUTCOME 5

An ability to (1) function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, (2) establish goals, plan tasks, and meet objectives.

**Electrical and Computer Engineering
OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET
ELEG 4247 – Sr Design and Professionalism I
FALL 2021**

Instructor: Turner / Musa

Title of Assignment

Team Contract

This is used to establish roles, team meeting, working relationship etc

Outcome Measured Using this Assignment

Outcome 5

An ability to (1) function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, (2) establish goals, plan tasks, and meet objectives.

Check the teaming problem characteristics related to this assignment

Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment.	
Requires students working in groups to:	
x	Organize and assign team roles; plan and keep good record of team meetings including documentation of individual contributions
	Share ideas, complete assigned task on time, help others, and be professional to each other (through peer evaluation of team members on these characteristics). No Peer Evaluations are done in ECE Sr Design
x	Resolve conflicts professionally within the group with the view of creating an inclusive and collaborative environment
Establish goals, plan tasks, and meet objectives.	
Requires students working in groups to:	
x	Set goals and objectives
x	Identify and break down work into tasks and subtasks and identify the personnel and deliverables for each.
	Develop a Gantt chart and critical path analysis for managing the project.
x	Establish major milestones for tracking progress and define performance metrics to measure success.
x	Track progress of team members to ensure project is on schedule and meets objectives (through submission of progress reports).

Brief justification of the suitability of assignment for the outcome

We use these tools for successful teamwork and collaboration. Teams develop a contract that outlines meeting schedule, and each team will provide a weekly report that is used by my faculty and instructor to gauge progress and or issues.

ELEG 4247 Senior Design

Fall 2021

Outcome 5 - Teamwork

Instructions - Team Contract (ABET Outcome 5.1)

Will do a check point in class on September 2

Final DUE: On or Before Sept 8 – Each Team Email to me a signed copy

Each Team must develop and sign a Sr Design contract that will define and determine work processes, relationships, and team operating norms for Senior Design

=====

Objective of this contract – must address these areas:

Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment

- i. **Organize and assign team roles**
- ii. **Plan and keep good record of team meetings including documentation of individual contributions**
- iii. **Share ideas, complete assigned task on time, help others, and be professional to each other (through peer evaluation of team members on these characteristics).**
- iv. **Resolve conflicts professionally within the group with the view of creating an inclusive and collaborative environment**

=====

Required Sections of your team contract:

Must Have the Standard Cover Page – see attachment on eCourse

1. Team Number and Project Objective

- Team number and overview of your project
- You must have one thorough statement that anyone can understand to describe your project objective – do not use any acronyms

2. Team Membership

- List team members and major
- List course instructors
- List Faculty project sponsor

3. Team Roles and Responsibilities

- List Team members and their roles
- Be sure to designate the Team Lead position

4. Team Working Relationship

- List those characteristics your team will employ to be successful in delivering your project

Instructions
Team Contract (ABET Outcome 5.1)

5. Team Meeting Agreement

- Please plan to have 15 to 20 hours outside of class available for team work
- Document the dates, times and location of outside team work agreement
- Team Work Deliverables
- TBD to be decided can be use now for location at this time if you don't know

6. Team Work Deliverables

- **Section A** – Joint Project Items
How will you work on joint project deliverables?
- **Section B** – Individual Project Items
How will you work on individual project items?

7. Team Documentation and Communications

- List how you will use team log books to track progress
- How will you communicate as a team?

8. Conflict Resolution

- How will you resolve issues, conflicts or disagreements?
- Who will you escape issues and to who?

9. Arbitration of Team Complaints

- See Attachment A on next page

10. Signature and Date

- Each person on the team must sign the contract

**Reminder: I will be looking for thorough and complete write up.
Please write complete sentences – using good grammar and
thoughtful consideration for each section. This should be developed
as a detailed contract that each team member has agreed to follow.**

Attachment A Must be included in all Team contracts

Arbitration of Team Member Complaints for Senior Design ELEG 4247 & ELEG 4248

ECE Senior Design courses require the highest level of teamwork and contribution by all members of a team. This includes regular and on time attendance to team meetings, doing fair share of assigned work and turning in work assignments or deliverables on time so not to hold up the other member of the team.

Should an individual team member start to exhibit poor performance that will negatively affect the others on that team the following steps will be followed:

1. Team members must first attempt to resolve the issue internally before escalation
2. If the problem/issues persist then the Team Lead should quickly send an email to Course Instructors that outlines the concern/complaint and actions done in an attempt to resolve the concern.
- 3 An investigation will be done by Course Instructor and a discussion will be held with all members on the Team.

If the majority of team member agree that the complaint is valid, then the Course Instructor has authority to reduce that individual's team related scores within a range of 5 to 15 points, pending the magnitude of the complaint.

(In the event of a tie then Course Instructor has final decision on how to handle the complaint)

By signing this contract all students will agree to this Team Contract by-law.

Working in Lab during COVID-19 Pandemic

Those in the lab must wear a mask

Those in the lab must socially distance

If you are not feeling well, do not come to team lab

While in lab each team must appoint a safety compliance person to ensure safe practices are followed

Weekly Progress Report
Due before the beginning of class every Wednesday –
email to VJTURNER@PVAMU.EDU And SMMUSA@PVAMU.EDU And Faculty Sponsor
Must have standard cover page

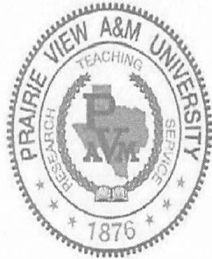
Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment

Objective of this weekly report :

1. Organize and assign team work
2. Plan and keep good record of team meetings including documentation of individual contributions
3. Share ideas, complete assigned task on time, help others, and be professional to each
4. Resolve conflicts professionally within the group with the view of creating an inclusive and collaborative environment
5. Keep your project on track and to identify concerns/issues early
6. Raise Issue and Concerns Early

This report must be detailed with explanation, good grammar/spelling and thorough.

PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING



Project Name => Tethered Drone Blimp Design Challenge
(your project name)

ELEG 4472: Senior Design & Professionalism I

Topic e.g Weekly
Progress Report =>

Topic: Meeting Time & Location Agreement
(topic should be subject of submission)

Team Number 10

Team Number and All
Team Members plus
Identify Team Lead

Submitted by
Team Member A
Team Member B (Team Lead)
Team Member C
Team Member D
Team Member E

Instructor: Turner

Date of Submission: 09/20/2017
(Date of submission)

Weekly Sr Design Project Status Report

Team Number :

Project Name:

Date :

Project Status : On Track OR Some Aspect at Risk OR Serious Concern
(Please Provide a weekly status)

Provide an email copy every Wednesday before
start of class

Email to VJTURNER@PVAMU.EDU

And SMMUSA@PVAMU.EDU

And YOUR FACULTY ADVISOR

Accomplishments From Previous Week

This section list all your accomplishments for the previous week

example : Met with Faculty Sponsor for 2 hours to finalize test protocol

Team Meeting Attendance

List outside of classroom time when/were you met and who attended each meeting and who did not attend (I want to know why a person missed team meeting)

example : Team 3 met on Friday November 14 in ECE 137 for 2 hours

example : All team members present except Mike who was on a job interview trip

Team Member Contribution to Project

List individual contributions of team member – show names

example : Completed final parts list (Joe)

Upcoming Action Items Assigned per Team Member

List upcoming work items assigned to each team member – show names

example : Need to complete design for project power source (Amy)

Tentative Plans for Upcoming Week

What are some plans/expected deliverable for the team next week

example : complete literature review for software options to develop operating code

Issues or Concerns

List any concerns you have that should be raised to instructor or faculty sponsor

example: Sponsor requirements keep changing

example: Camera parts on back order

Can be on more than one page

Teamwork Evaluation Form
ECE Senior Design & Professionalism
Teamwork-Outcome 5

Title of Presentation: <i>Team Contract + Weekly Progress Reports</i>						
Team Number and Members: <i>Various Team Examples</i>						
Date of Presentation: <i>Fall 2021</i>						
Name of Evaluator and Affiliation (University or Company name) <i>VSTUire</i>						
	Excellent 99	Very Good 89	Average 79	Below Avg. 69	Poor 54	Comments
Function Effectively on a Team						
Have a signed contract and agreed method of working together	✓					
Organize and assign team roles	✓					
Plan and keep good record of team meetings including documentation of each team member contributions	✓					
Create an inclusive and collaborative environment		✓				
Complete assigned task on time,		✓				
Help others, share ideas, and be professional to each other	✓					
Detailed Weekly Progress Reports turned in every Wednesday	✓					
Able to show that all team members are making equal contribution to work deliverables	✓					
Planning and Tracking Progress						
Able to establish goals and objectives (deliverable)	✓					
Identify and break down work into tasks and subtasks	N-A					
Develop a Gantt chart and critical path analysis for managing the project	N-A					
Establish major milestones for tracking progress	N-A					
Track progress of team members to ensure project is on schedule and meeting goals/objectives	N-A					

AUG = 96

PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING



**Project Name: Converting a Mechanical Operated System to an
Electronic Operated System**

ELEG 4247: Senior Design & Professionalism I

Topic: Team Contract

Team Number: 4

Submitted by: 9/11/2021

**Armand Feuba Baweu
Eulises Benito Garcia
Francisco Hernandez
Franky Williams Lonfo
Jacqueline Torralba (Team Lead)**

Instructor: Professor Turner

Project Name: Converting a Mechanical Operated System to an Electronic Operated System

By signing this contract, all students will agree to these Team Contract by-laws:

1. Team Number and Project Objective

- The team name will be Team 4.
- The objective of this project is to change the mechanical operated system switch of a golf cart, to an electric operated system switch.

2. Team Membership

- The members of this team are Armand Feuba Baweu a computer engineering major, Eulises Garcia Benito an electrical engineering major, Francisco Hernandez an electrical engineering major, Franky Williams Lonfo an electrical engineering major, and Jacqueline Torralba an electrical engineering major.
- The course instructors for the class will be Professor Turner and Professor Musa.
- The faculty project sponsor for the project will be Dr. Fuller.

3. Team Roles and Responsibilities

- Armand Feuba Baweu: Software Developer
Alternate Role: Team Leader

The software developer will develop software to enable the specific task that needs to be achieved for this project. They take on the responsibility to research, design and manage the software language that will be used.

- Eulises Garcia Benito: Scribe
Alternate Role: Test Lead

The scribe is the attendee at a meeting who documents and keeps the records of meetings, decisions, and updates for the project. The scribe will communicate with the team lead to help write the weekly report. Lastly, It will provide all the information to the team for the final report.

- Francisco Hernandez: Data Analyst
Alternate Role: Software Developer

Data Analyst brings together theory and practice to solve solutions such as the project's objective. Based on the project, research must be compiled in order to test the logic of the team's goal. They're also responsible to draw a conclusion based on the objective. Within data management, the analyst will have the final decision if one can't be made.

- Franky Williams Lonfo: Test Lead

Alternate Role: Data Analyst

The test lead will primarily be handling the equipment to reach the goal of the project. The test lead will be responsible for assembling the project and will have final say on the testing or assembly of the project.

- Jacqueline Torralba: Team Leader

Alternate Role: Scribe

The team leader will organize and make group meetings and guide towards progress with the team. They will oversee each member and provide direction if needed. The team leader will have direct communication with Dr. Fuller and they will need to have an understanding of the project requirements.

4. Team Working Relationship

- The team members have a responsibility to respect each other and other teams.
- Team members must communicate openly with each other about the project and treat each member in the team equally.
- Each member must also be responsible with outside social gatherings due to the COVID-19 pandemic. It is expected that all members wear masks when possible so as not to contribute to the spread or become ill.
- The team must be honest and reliable with regards to their completion schedule.
- The Team Leader must find a way to create the meeting with Dr. Fuller, so he can help us with our project.

5. Team Meeting Agreement

- This team is required to meet 15-20 hours a week outside of class time to achieve the goals set.
- During the meetings everyone is required to participate and give their inputs so the team can submit exceptional deliverables.
- The meetings will be in person every Tuesday, Wednesday, and Thursday at 5:00 pm.
- The length of the meetings will be determined by the team depending on how much needs to be done.
- If needed, the team is also required to meet on Sundays through zoom at 8pm.
- All team members are required to give advance notice to the team leader if he/she will not be present at a meeting.

6. Team Work Deliverables

- We all intend to be involved and distribute the work fairly. The approach is to value each individual's idea and develop a plan to provide consistency. We will meet once

a week (via Zoom, 115 Electrical Engineering Building) to discuss our individual work and how it contributes overall.

- Based on each team member's background, we will determine the tasks of which individual will get. However, if a group member has concerns or issues, we as a group will be looking out for one another to resolve that matter.
- Communication must be met when a member can't submit their tasks in time or join meetings. As a group, we can be flexible exchanging shifts, but work equality still has to be required. A member can face violation if these standards aren't met.
- Before submission and deadlines, each member will look over each individual's work in order to provide quality work.

7. Team Documentation and Communications

- To better track progress of the team by using a team log book, we will firstly start with the project outline which will help us on the set point including the duration and the application of the team members on a specific given point and assignment.

We will focus on the deliverable and on the milestones to help stay on track with the project. Also, we will set realistic, clear and measurable goals that will help each member of the group to be able to understand as we move forward with the project.

In this section, we will use a project tracker template or a project tracking software to keep track of time , costs and tasks.

- To communicate we will be meeting regularly with the team and having a clear deadline of any given tasks and the support of transparency in order to get all of us on the same page. We will also be using GroupMe and Zoom to facilitate this communication.

8. Conflict Resolution

- This is one team, concern or issues will first be confronted as a group.
- We plan to resolve conflicts by talking it out in a professional manner. Once a week during our meetings, every individual will have the opportunity to express any concerns. As a team, we will find ways to overcome those obstacles.
- As a last resort, we will contact Dr. Musa and Dr. Turner if a conflict can't be resolved.

9. Arbitration of Team Complaints for Senior Design ELEG 4247 & ELEG 4248

ECE Senior Design courses require the highest level of teamwork and contribution by all members of a team. This includes regular and on time attendance to team meetings, doing fair share of assigned work and turning in work assignments or deliverables on time so as not to hold up the other member of the team.

Should an individual team member start to exhibit poor performance that will negatively affect the others on that team the following steps will be followed:

1. Team members must first attempt to resolve the issue internally before escalation.
2. If the problem/issues persist then the Team Lead should **quickly** send an email to Course Instructors that outlines the concern/complaint and actions done in an attempt to resolve the concern.
3. An investigation will be done by the Course Instructor and a discussion will be held with all members on the Team.
4. If the majority of team members agree that the complaint is valid, then the Course Instructor has authority to reduce that individual's team related scores within a range of 5 to 15 points, pending the magnitude of the complaint.

(In the event of a tie then Course Instructor has final decision on how to handle the complaint)

By signing this contract all students will agree to this Team Contract by-law.

Working in Lab during COVID-19 Pandemic

Those in the lab must wear a mask.

Those in the lab must socially distance themselves.

If you are not feeling well, do not come to the team lab.

While in the lab each team must appoint a safety compliance person to ensure safe practices are followed.

10. Signature and Date

Armand Feuba Baweu

Armand Feuba Baweu 9/10/2021_____
Date

Eulises Garcia Benito

Eulises Benito Garcia 9/10/2021_____
Date

Francisco Hernandez

Francisco Hernandez 9/10/2021_____
Date

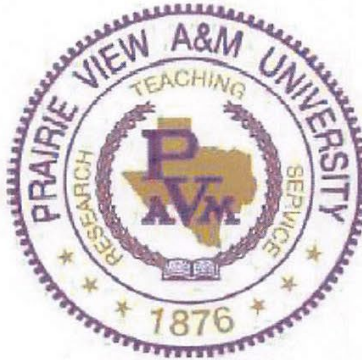
franky williams lonfo

Franky Williams Lonfo 9/10/2021_____
Date

Jacqueline Torralba

Jacqueline Torralba 9/10/2021_____
Date

PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING



**Converting a Mechanical Operated System to an Electronic
Operated System**

ELEG 4247: Senior Design & Professionalism I

Topic:

Team Number 4

Submitted by:

**Armand Feuba Baweu
Eulises Garcia Benito
Francisco Hernandez
Franky Williams Lonfo
Jacqueline Torralba (Team Lead)**

Instructor: Professor Turner

Date of Submission: 09/22/2021

ELEG 4472/4482
Weekly Sr. Design Project Status Report

Team Number: 4

Date: September 22, 2021

Project Name: Converting a Mechanical Operated System to an Electronic Operated System

Project Status: On Track

Accomplishments from previous week

The team met with Dr. Fuller in person to talk about the beginning progress of the project. After the meeting the team we discussed the marketing requirements for the PowerPoint matrix. We then began researching for the powerpoint and seeing how we will approach this.

Team Meeting Attendance

- Team met on Sunday August 29th, 2021 at 8:30pm - 9:30 pm Zoom
- Team met on Sunday September 5th, 2021 at 8:30pm - 9:30 pm Zoom
- Team met on Thursday September 9th, 2021 4:00 – 8:00 pm face to face
- Team met on Thursday September 16, 2021 4:00 – 8:00 pm face to face
- Team met on Monday September 20, 2021 at 8:30pm - 9:30 pm Zoom

Team Member Contribution to Project

- Assigned roles for the project (Jacqueline)
- Researched other technologies similar to that of electrical switches (Everyone)
- Worked on prototype (Franky)
- Contributed to the initial slides of the PPT (Everyone)

- Met with Dr. Fuller our sponsor to discuss theory of DC Motors (Everyone)

Upcoming Action Items assigned per Team Member

- Will work on Matrix Slide Completion (Everyone)
- Complete the Constraints and Assumptions Slide (Eulises)
- Look into the Arduino Language (Armand)
- Research for the Impact Slides (Francisco, Francisco)

Tentative Plans for Upcoming Week

- All team members should have a deeper understanding of DC Motors.

Issues or Concerns

- Not Applicable