

COURSE BINDER

**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

**PRAIRIE VIEW A&M UNIVERSITY
ROY G. PERRY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ELEG 4247- Senior Design & Professionalism I
FALL 2021**

I. COURSE DESCRIPTION IN ABET FORMAT

II. ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in Course

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Original Test Questions & Master Solution/grading scheme used

(Summary of topics can be a separate page or include on the assignment itself)

Above Average (Graded original work)

Average (Graded original work)

Below Average (Graded original work)

III. FINAL EXAMS REPORTS

Summary of Topics covered by Quiz

Original Quiz Questions & Master Solution/grading scheme used

Above Average (Graded original work)

Average (Graded original work)

Below Average (Graded original work)

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Original Homework Questions & Master Solution/grading scheme used

Above Average (Graded original work)

Average (Graded original work)

Below Average (Graded original work)

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Project Problem Statement and Grading Scheme

Above Average (Graded original work)

Average (Graded original work)

Below Average (Graded original work)

Course Description in ABET Format
DEPARTMENT OF ELECTRICAL & COMPUTER
ENGINEERING

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.)	Outcome 1 (ELEG 4287 Only) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

	- Formulate the complex engineering problem into an engineering model or design – showing any math or science or technology needed to validate the 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

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (ELECTRICAL ENGINEERING STUDENTS)

Outcome 3-part I:

An ability to communicate effectively with a range of audiences, orally

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	3-Oral
Semester	Semester Class Average (%)
Fall 2021	88
Fall 2020	92
Fall 2019	90
Comments on Trend of Data (Improving or deteriorating)	Overall trends continue to be good, emphasize more individual practice. We saw more late submission this year which cause scores to be lower. 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.

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (ELECTRICAL ENGINEERING STUDENTS)

Outcome 3-part II:

An ability to communicate effectively with a range of audiences, written technical communication

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	3-Written
Semester	Semester Class Average (%)
Fall 2021	87
Fall 2020	94
Fall 2019	91
Comments on Trend of Data (Improving or deteriorating)	We saw more late submission this year which cause scores to be lower. 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 emphasis to the students to meet the deadline in turning the assignments

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (ELECTRICAL ENGINEERING STUDENTS)

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

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	4
Semester	Semester Class Average (%)
Fall 2021	97
Fall 2020	86
Fall 2019	91
Comments on Trend of Data (Improving or deteriorating)	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 will continue to have a mix individual test and team assignments to ensure collaborations and better understanding of ethics.

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (ELECTRICAL ENGINEERING STUDENTS)

Outcome 5:

An ability to (1) function effectively on a team whose members together (2) provide leadership, create a collaborative and inclusive environment, (3) establish goals, plan tasks, and meet objectives

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	5
Semester	Semester Class Average (%)
Fall 2021	90
Fall 2020	100
Fall 2019	96
Comments on Trend of Data (Improving or deteriorating)	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. We have to give students good GANTT Charts examples of previous teams to ensure we can meet this outcome for project task planning.

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (**COMPUTER ENGINEERING STUDENTS**)

Outcome 3-part I:

An ability to communicate effectively with a range of audiences, orally

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	3-Oral
Semester	Semester Class Average (%)
Fall 2021	88
Fall 2020	92
Fall 2019	90
Comments on Trend of Data (Improving or deteriorating)	Overall trends continue to be good, emphasize more individual practice. We saw more late submission this year which cause scores to be lower. 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.

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (COMPUTER ENGINEERING STUDENTS)

Outcome 3-part II:

An ability to communicate effectively with a range of audiences, written technical communication

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	3-Written
Semester	Semester Class Average (%)
Fall 2021	91
Fall 2020	93
Fall 2019	95
Comments on Trend of Data (Improving or deteriorating)	We saw more late submission this year which cause scores to be lower. 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 emphasis to the students to meet the deadline in turning the assignments

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (COMPUTER ENGINEERING STUDENTS)

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

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	4
Semester	Semester Class Average (%)
Fall 2021	88
Fall 2020	88
Fall 2019	67
Comments on Trend of Data (Improving or deteriorating)	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 will continue to have a mix individual test and team assignments to ensure collaborations and better understanding of ethics.

*Expected Semester Class Average = 80% (or as defined by the program)

II ASSESSMENT RESULTS FOR CURRENT AND PAST THREE PERIODS

Program Outcomes Assessed in this course (COMPUTER ENGINEERING STUDENTS)

Outcome 5:

An ability to (1) function effectively on a team whose members together (2) provide leadership, create a collaborative and inclusive environment, (3) establish goals, plan tasks, and meet objectives

Assessment Summary of Class Semester Averages for Outcomes (Should be provided for Fall 2019 through Fall 2021 Assessment Period)

Outcomes	5
Semester	Semester Class Average (%)
Fall 2021	90
Fall 2020	100
Fall 2019	96
Comments on Trend of Data (Improving or deteriorating)	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. We have to give students good GANTT Charts examples of previous teams to ensure we can meet this outcome for project task planning.

*Expected Semester Class Average = 80% (or as defined by the program)

End of Semester Course Assessment Report

Each 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

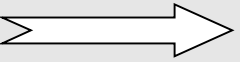
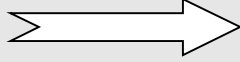
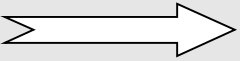
- Instructors summary of overall performance trend for each outcome measured over the last three periods.

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
NO

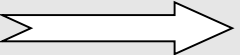
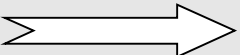
END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT
ELEG 4247-P01 SENIOR DESIGN & PROFESSIONALISM I/ FALL 2021 SEMESTER
(ELECTRICAL ENGINEERING STUDENTS)
Fall 2021 SEMESTER

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 individual 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		

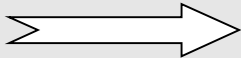
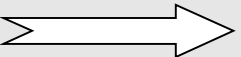
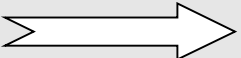
END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT

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

Fall 2021 SEMESTER

Report Prepared by: Turner & Musa

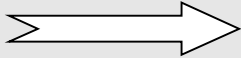
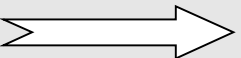
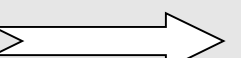
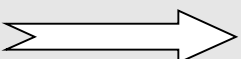
Report Date: December 2021

Semester	Analysis Type	Number of Students	Outcome 3 – Oral Communication			Outcome 3 – Written Technical Communications		
			An ability to communicate effectively with a range of audiences			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	14 - CE	80	88	79	80	91	100
Fall 2020	Direct	12 - CE	80	92	100	80	93	100
Fall 2019	Direct	7 - CE	80	93	100	80	95	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
(COMPUTER 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	14 CE	80	88	93	80	90	100
Fall 2020	Direct	12 CE	80	88	75	80	100	100
Fall 2019	Direct	7 CE	80	67	43	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 individual 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		