ESCI/MENG 3200 Fluid Dynamics – An exam problem which in the fall was a two-dimensional conservation, in spring was a dimensionless analysis, Buckingham Pi problem
AENG 4400 Stability and Control – This assessment item was a review of overall graded performance, is being shifted to a specific artifact for future assessment reviews
MENG 2150 Dynamics and MENG 3200 Fluid Dynamics are taught in Madrid. These courses have other program students (Mechanical and Civil Engineering primarily), but results are sorted by degree program. AENG 4400 rarely has non-Aerospace students.

Outcome 3:
AENG 2020 Introduction to Aerospace Engineering – Project reports written by teams of 2-3 students
ESCI/MENG 3201 Fluids Lab – Formal lab report written individually for the Flat Plate Boundary Layer Lab
AENG 4014 Flight Vehicle Analysis and Design I – 1) Final project team presentation of ~25 minutes covering complete senior design project presented to a panel of professional engineers, 2) Team Project Poster for SSE Showcase, a public event featuring posters from all senior design disciplines, 3) Team AIAA Paper, a paper written to conform to the expectations of the AIAA Region V Student Conference, in which some teams participate but all teams compose, 4) Final project report
Introduction to Aerospace Engineering is taught in Madrid. Fluids Lab has other program students (Mechanical and Civil Engineering primarily), but results are sorted by degree program. AENG 2020 and AENG 4014 rarely have non-Aerospace students.

Outcome 5:
ESCI/SE 1700 Engineering Fundamentals – Team project performance based on instructor observations, team questionnaire, and final project report/presentation
ESCI/MENG 3101 Solid Mechanics Lab – Team questionnaire
AENG 4014 Flight Vehicle Analysis and Design I – Instructor review of bi-weekly team meetings, final project team presentations presented to a panel of professional engineers
Engineering Fundamentals is taught in Madrid. Engineering Fundamentals includes students in all engineering majors as well as other majors, but results are sorted by degree program. Solid Mechanics Lab has Mechanical and Civil engineering students, and the results are not sorted by major. Senior Design rarely has non-Aerospace students.

Outcome 7:
ESCI/SE 1700 Engineering Fundamentals – Development and explanation of a bibliography related to the class project
AENG 3150 Astrodynamics – Case study of aerospace contractor or space mission
AENG 4014 Fr2 (e (N)-2.3 (G)--1.9 (h9.7 (f5-6 (e)-63(G)--1.9 i(o)-6.6 le)-6 (n)-0.7 (As)1.8 (t)-22 (e (h)253 (io)4.3 ((L)-4.9 (ic)-2 ( )10.6 (M)-4.8 Di)7. (n)-0.7 (io)4.3 (-2.3

Outcome 7:
ESCI 1700 20 of 24 of graded aerospace students met expectations
AENG 3150 21 of 25 aerospace students met expectations, with 19 exceeding expectations. Three students did not submit the assignment and one did not follow instructions
AENG 4014 All ten teams (44 students, including a Mechanical Engineer major and an Engineering Physics major who could not be separated from the team scores) achieved the target score of 3 (Good). Four teams exceeded 4 (Excellent) and therefore exceeded expectations.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you? Address both a) learning gaps and possible curricular or pedagogical remedies, and b) strengths of curriculum and pedagogy.

Outcome 1
- Students had trouble with prereq material (Math & Physics) and were not well prepared. These concepts were retaught in the dynamics and fluid dynamics courses. This could be because of Covid.

Outcome 3
- Student overall written and oral communication skills (as opposed to specifically technical) have generally met or exceeded expectations.
- Students need improved technical writing skills as opposed to general writing skills including incorporation of equations/tables/data/plots.

Outcome 5
- Most design teams (summative/achieved assessment) appear to at least meet expectations.
- Currently, we don't formally introduce team management skills most of the curriculum until senior design even though there are many team activities.

Outcome 7
- Students generally demonstrate appropriate library and bibliography skills.
- Senior design teams naturally develop new knowledge to complete their projects.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss the results and findings from this cycle of assessment?

Faculty assessed outcomes 1 and 3 in April/May 2023 and outcomes 5 and 7 in Nov 2023.

t h m - 0 . 7 (e) - 1 . 8

- Artifact for AENG 4400 is being redone to be more specific, hopefully capture complex problem (AE definition)

Outcome 3

- Students need improved technical writing skills as opposed to general writing skills, including incorporation of equations/tables/data/plots.
- Action plan – We are in the process of developing common definitions for report format, figures, equations, calculations, and sections to be used generally across the curriculum. We have also submitted AENG 4014 to Core as a Writing Intensive option which will increase the emphasis in technical writing for that course.

Outcome 5

- Currently, we don't formally introduce team management skills.
- Action plan – We are in the process of creating first year team building exercises in collaboration with ROTC.

If no changes are being made, please explain why.

Outcome 7 is awaiting approval for our Capstone 3 as part of senior design, will evaluate potential changes after that approval.

7. Closing the Loop: Review of Previous Assessment Findings and Changes
   A. What is at least one change your program has implemented in recent years as a result of previous assessment data?

   A common first year Ignite course (SE 1700) was introduced in Fall 2022. Apart from satisfying the core requirement, the course provides an opportunity to work in interdisciplinary teams doing interdisciplinary work on a complex problem. The course was int

AEME ABET Assessment Review Form

This form is a summary of the collective departmental review of learning outcome assessment used to record review group thoughts about assessment materials collected.

Program (AE or ME): AE Date materials reviewed: 04/24/2023, 05/10/2023

Criterion reviewed (circle one): 1 2 3 4 5 6 7

an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Semester(s) reviewed: Fall 2022 (primarily)

Reviewers: Alexander, Condoor, Gururajan, Jayaram, LeBeau, Lei, Marmolejo, McQuilling, Swartwout

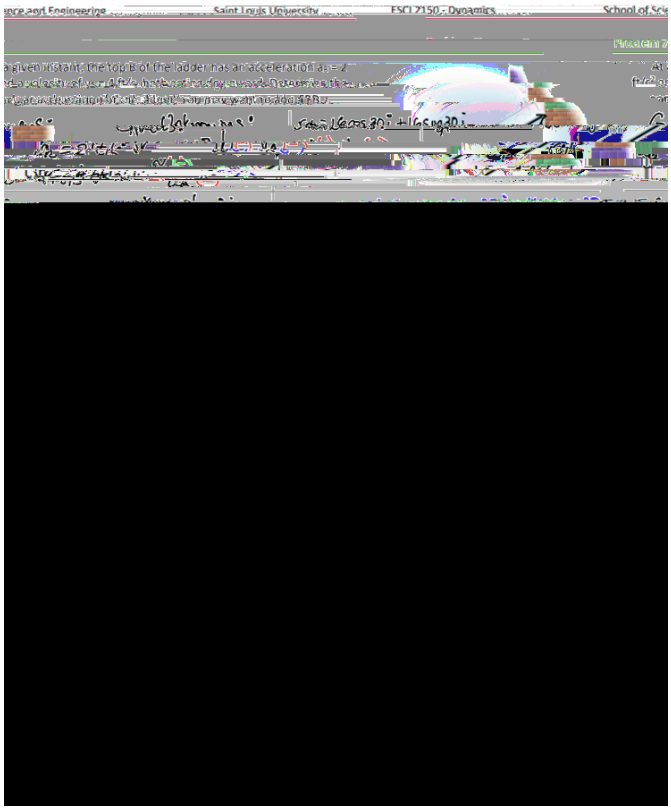
Courses and instruments:

Course	Semester	Description (ind/Grp)	Level	Math	Sci	Cplx
MENG 2150						

Learning Outcome: 1 (Solve Problems using SEM) 2 (Design in Global Context) 3 (Effective Communication) be)1ab5sbSi C (i)5 C6)

Indicator	Below Expectations	Meets Expectations	Above Expectations
Ability to analyze and solve two-dimensional rigid body kinematic problems involving rotation around an external instantaneous center of zero velocity.	Student fails to solve the problem due to significantly improper procedures, incorrect equations, incomplete work, and/or significant mathematical errors.	Student uses mostly proper procedures to formulate and solve the resulting governing equation -r ET q 123.95l6gB.1 (q)-1.9 (an)2.2 (t)-2.9 (lyS)-1.9 (3TJ ET Q q 1c 0.003 Tw 0 -1.217 TD	

This approach provided a clear framework for evaluating student performance and determining their level of achievement based on the established criteria. It allowed for a comprehensive assessment that considered both numerical scores and qualitative analysis, taking into account the specific errors made and their alignment with the performance expectations outlined in the rubric.



Learning Outcome:	1 (Solve Problems using SEM)	2 (Design in Global Context)	3 (Effective Communication)	
[select 1]	4 (Ethics in Global Context)	5 (Functional Teamwork)	6 (Experiment and Draw Conclusions)	
	7 (Lifelong Learning)			

Course: ESC3200 (Fluid Dynamics) (Fall 2022)

Location in Program:	Early	Middle	End

Learning Outcome 1: an ability to 2M7 0 6 (i04 66Ti (ni)-8 (ng)-8.3 (O)-1.9 (ut)6.1 (c66TiTm (2M7ni),J /TT0(c66TiTm6Ti (ni)r))]T)-4 (:)]u(ng)-8laut)6.1e(i04 6,J /TT0c66T (u

Learning Outcome:	1 (Solve Problems using SEM)	2 (Design in Global Context)	3 (Effective Communication)
[select 1]	4 (Ethics in Global Context)	5 (Functional Teamwork)	6 (Experiment and Draw Conclusions)
	7 (Lifelong Learning)		

Course: AENG 4400 (STABILITY AND CONTROL) (Fall 2022)

Location in Program: Early Middle End

Method: Composite score of homework, quizzes, projects, mid-term and final exams.
The class average is 82.50%.

Rubric : A score of 70% and above

Desired result : 70% of students will meet expectations

Student performance

AEME ABET Assessment Review Form

This form is a summary of the collective departmental review of learning outcome assessment tools used to record review group thoughts about assessment materials collected.

Program (AE or ME): AE Date materials reviewed: 05/10/2023

Criterion reviewed (circle one): 1 2 3 4 5 6 7

an ability to communicate effectively with a range of audiences

Semester(s) reviewed: Fall 2022 (primarily)

Reviewers: Alexander, Condoor, Gururajan, Jayaram, LeBeau, Lei, Marmolejo, McQuilling, Swartwout

Courses and instruments:

Course	Semester	Description (ind/Grp)	Level	Type	Audience
AENG 2020	AE(F)	Technical Reports on Projects, 2-3 student teams	Early Formative	Written	Early Technical
MENG 3201/MENG 3111	ME (F) AE (S); ME (S), AE (F)	Formal Lab Report, individua	Middle Formative	Written	Technical
AENG 4014	AE (S)	AIAA Paper (group), Poster (group), Final Presentation (group), Final Report (group)	Late Summative	Written, Visual, Oral, Written	Technical, Public, Professional, Technical

Strengths and weaknesses:

Students need improved technical writing skills as opposed to general writing skills. Continuing incorporation of
(710.6i04563llt.6.6748 .6 (f) 477 48.95632678/P (a)-BDC -0.001 Tc 0.003 T77T* [(S)1.32678/P)-0.8 (a)-BDC -0.001/TT1 1 Tf -0.004 T7 -0.005 Tw 7.9856 05 (t7 Td [(

Learning Outcome:	1 (Solve Problems using SEM)	2 (Design in Global Context)	3 (Effective Communication)
[select 1]	4 (Ethics in Global Context)	5 (Functional Teamwork)	6 (Experiment and Draw Conclusions)
	7 (Lifelong Learning)		

Course: AENG 2020 (Introduction to Aerospace Engineering) (F2022)

Location in Program: Early Middle End

Learning Outcome 3: an ability to communicate effectively with a range of audiences

Instrument: Project Reports. There are two reports, completed by teams of 2 students. The first is a rocket project, the second is a glider project.

Methodology: The student teams submit a technical report for their projects. In this case, the rocket project is evaluated against the provided rubric by the class instructor.

Rubric: See rubric below.

Desired result: 70% of students scoring Meets or Above Expectations

Students assessed: The evaluation of eight groups covering 17 aerospace students is provided for the assessment.

Student performance: Evaluation distributions for each indicator of the rubric are given in the table along with the percentage of students achieving Meets and Above Expectation. The average is a total score for each student based on a simple linear average of the five indicators.

more instruction might be helpful in terms of this introduction. Potential courses of action include:

1. Providing a more detailed outline or even a sample report based on a simplified set of results for the rocket project. The second project could be used to then evaluate writing skills in a less scripted assignment.
2. Increasing project time- both projects seemed rushed a bit in the transition from a 3 credit to a 1 credit course. While the overall time allocated for the students to work on each project was not that different, the degree of class interaction was considerably lower when only meeting once a week during the project periods. Extending the project time scale by 1-2 weeks and using flipped classroom techniques so that students conduct more work in the class time on this project

Model Rocket Payload Estimation

Given the model rocket, estimate a means by which the rocket will reach a maximum altitude of 150 ft above ground level. Conduct a launch under instructor's supervision and compare experimentally determined altitude to the target altitude of 150 feet.
Launch dates: October 19 & 24.
Launch site: Behind Oliver Hall

What do you conclude from this exercise?

Deliverables:

AIAA format report following the provided format.

The report should contain, among other things,
1. Creo (or similar CAD) drawing of rocket components and assembly.
2. Incompressible drag coefficient estimate for the rocket at burnout velocity, V_b
3. Center of gravity (CG) estimation and comparison to experimentally determined CG.
4. A MATLAB Trajectory estimate based on incremental analysis of Newton's Laws
5. An OpenRocket analysis of the trajectory and stability of the rocket
6. Comparison of results from (5) to your estimates
7. Sources of Error

Details of Trajectory

How did you analyze the trajectory (height) of your rocket? How did you use the thrust data? How did you calculate your proje trajectory? What were your calculations and results? What thrust data did you use? Describe your MATLAB code here (but put the code in the Appendix).

Test Results

Here is where you describe your flight test and OpenRocket simulations. How did the rocket perform and how did it compare to your estimates. Compare the altimeter and/or simulation data to your trajectory estimates.

Sources of Error and Conclusions

So how did it turn out - did you rocket perform as expected? If not what were the sources of error that caused the differences (or the failure of the launch, depending) What would you do different next time? What did you learn?

Appendix

If you have bigger figures or other things that do not fit well in the paper, this is where they can go. Some folks put their CAD

Learning Outcome: 1 (Solve Problems using SEM) 2 (Design in Global Context) 3 (Effective Communication)
[select 1] 4 (Ethics in Global Context) 5 (Functional Teamwork) 6 (Experiment and Draw Conclusions)
7 (Lifelong Learning)

Course: ESC 3201 (Fluid Dynamics Lab) (Fall 2022)

Location in Program: Early Middle End

Learning Outcome 3: an ability to communicate effectively with a range of audiences

Instrument: Formal Lab Report. For Saint Louis, this is the Flat Plate Lab. The lab is conducted and data collected as a group but the lab analysis and report is done individually.

Methodology: The lab report is to be written to communicate the laboratory purpose, procedures, findings, analysis, and conclusion to professional colleagues. The lab is graded by teaching assistants and/or the instructor based on a rubric specific to this lab. Once graded, the formal labs and grading of writing-specific subsections are reviewed by the instructor and an indicator level following the rubric provided for SLO assessment is det6 (d)-rsd b(h)13.1tw T6r1(r)89 Tf 0 Tc 0 Tw 23.196 0 Td ( )4j EMC /12 >141C /TT0 1 Tf -26.457 -1.217 Td ( )5j E

3) Ability to use proper grammar and spelling.	Final report has numerous grammatical and spelling errors, no evidence of proofreading.	Final report has several grammatical and spelling errors, appears to have been incompletely proofread.	Final report has minimal grammatical and spelling errors, appears to have been proofread.
4) Ability to use effective writing syntax and voice.	Final report has sufficient syntax, tense, and voice issues to significantly hamper the understanding of the report by the reader.	Final report has occasional sections where the voice and tense are inconsistent or incorrect, or where the sentence/paragraph structure is not well organized or lacks sufficient clarity.	Final report uses readily comprehensible and followable syntax and uses proper voice and tense consistently throughout the report.
5) Overall communication quality.	Report fails to convey main points of the lab without significant parsing and re-reading of sections, if at all.	Report conveys information in a sufficiently logical, efficient, precise, and complete manner such that the main points of the lab are generally understood with a single read.	Report conveys information in a logical, efficient, precise, and complete manner such that the lab is fully understood with a single read.

FLAT PLATE BOUNDARY LAYERS

OBJECTIVE

In this lab you will learn methods to:

- Measure flat plate boundary layer velocity profiles under laminar and turbulent conditions
- Compare velocity profile measurements to accepted theoretical values

INTRODUCTION

Flow in contact with a wall is assumed to match the velocity of the wall (no slip condition). Thus moving away from the wall, the fluid must transition from the velocity of the wall to the velocity of the freestream, which is the primary flow velocity. This creates a region called the boundary layer in which the flow speed is between the wall and the freestream. The thickness of the boundary layer is often labeled as δ. In the case of flow over a stationary flat plate, this thickness increases as the flow moves down the plate as shown in Fig. 1.

Figure 1: Natural transition of a laminar to turbulent boundary layer on a smooth flat plate

Initially, this ete b-2 (e)4 (s)- sü.EóC*L.B.DäÂN:A"ää2!ä<,Ò¦ JmbÜ¤2¤2.1 .DÒ Ä"" ó8*JL.JA.â]" æ¤ÌÑNNE"ö! Initia ve b aa

distance to the surface of the plate and δ the boundary layer thickness. Two approximations have been shown to work well:

$$\frac{u}{U} = \frac{3}{2}\left(\frac{y}{\delta}\right) - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$$ Nikuradse cubic approximation for Laminar B.L (1)

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{\frac{1}{7}}$$ Power law profile for Turbulent B.L (2)

EXPERIMENT

1. Record the ambient temperature and pressure in the room.
2. Determine the wind speed the tunnel must run below to ensure laminar flow over the smooth plate. This means the Reynolds number must be kept below the transitional value for air flow over a flat plate.
3. Knowing the wind speed and the Reynolds number, calculate the respective maximum dyn 23 >>BDC -1.5 -2 (veC(a)4 (<00A700B: (<055)Tc 0 T

4.5	4.2
4	4

For the poster (2), evaluation distributions for each indicator of the rubric are given in the

			reader.

and conclusions or has significant errors. Does not conform to expectations of a student AIAA conference paper.	analysis and conclusions, but an emphasis e hud oac.3 (y)-7.5 (s)-4gosiiudassoeigtes3 errsrr em-3 (4-0.3 (e)-3.2 (s)-42.2 (o))-3 (rr)4.3 (t)	

OVERALL EVALUATION GUIDELINES SHEET
(Used for Panel Assessment)

5 - Outstanding:

Ready to proceed to next phase. No apparent design issues. Analysis clearly demonstrates that the key requirements can be satisfied. A portion of the engineering work (design, analysis and developmental testing) is already at the level of maturity for the next phase. (If applicable for flight competition; the manufacturing and testing approach is good). Would definitely invest in project funding.

Presentation was clear and well organized. Audio and visual presentations complemented each other and enhanced understanding. Plots and tables were easily understood. Presenters conducted themselves in a professional manner.

4 - Excellent:

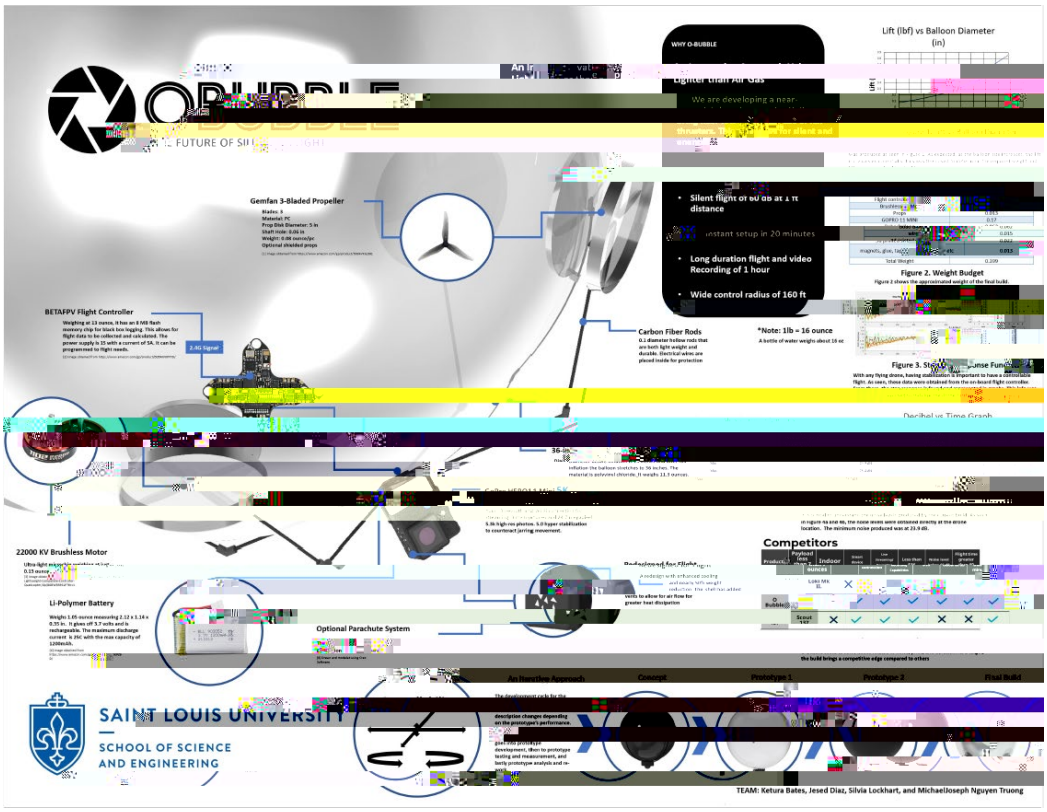
Ready to proceed for next phase. A few minor design issues that can be easily resolved in next phase of project. Analysis demonstrates that the key requirements can be satisfied. The engineering design and analysis is at high level of maturity for the current phase. (If applicable for flight competition; the manufacturing and testing approach is acceptable.) Would likely invest in project after getting more information about the design.

Requirement Definition		
Key Design Drivers, Primary Requirements, Derived Requirements, Requirement Verification		
Project Model		
Need Identification, Business/Project Case, Heritage/Peer Competitor Designs, Market/Customers, Value Proposition, Awareness of Broader Impacts		
System Development and Design		

Presents in a professional manner including vocabulary, language style, and appearance		
Responds effectively to questions		
Demonstrates collaborative work activity and project focus		
Quality of Overall Presentation Skills		
ABET Assessment	(1 to 5)	
Design meets identified needs and considers some non-technical aspects like cost, safety, public welfare and/or financial, cultural, economic, societal, or environmental impacts		
Team recognizes ethical and professional responsibilities, including safety and broader impacts on society, culture, economy, and/or the environment.		
Team evidences an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		

Other Comments

Poster Example



AEME ABET Assessment Review Form

This form is a summary of the collective departmental review of learning outcome assessment. It is used to record review group thoughts about assessment materials collected.

Program (AE or ME): AE Date materials reviewed: 11/11/2023

Criterion reviewed (circle one): 1 2 3 4 5 6 7

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

Semester(s) reviewed: Fall 2022, Spring 2023 (primarily)

Reviewers: Alexander, Babaiasl, Condoor, Gravish, Jayaram, LeBeau, Ma, Marmolejo, Swartwout

Courses and instruments:

Course	Semester	Description (ind/Grp)	Level	Team Mgmt	Collab
ESCI/SE 1700 ESCI/MENG	AE (F); ME (F)	Instructor assessment, possibly some type of student survey	Early Formative	Y	Y

March 2023

Learning Outcome:	1 (Solve Problems using SEM)	2 (Design in Global Context)	3 (Effective Communication)
[select 1]	4 (Ethics in Global Context)	5 (Functional Teamwork)	6 (Experiment and Draw Conclusions)
	7 (Lifelong Learning)		

Course: AENG 4014 Flight Vehicle Analysis and Design II (S2023)

Location in Program: Early Middle Late

Learning Outcome 5: 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

Instrument: 1) Assessment of industry review panel of team student presentations at the end of the semester.
2) Instructor assessment of team collaboration and management via planning meetings and project development.

Methodology: 1) Each senior design team makes a presentation about their work at the end of the spring semester, approximately equivalent to a detailed/prototype design review. This presentation is evaluated by a

Observations: Most teams had multiple planning meetings where they were not fully prepared with all necessary information, and some had persistent dominant members. However, most teams did have a consistent management structure and encouraged participation by all members. Work distribution was good for about half the teams. Some teams improved in these areas as the semester progressed leading to higher scores in the presentation evaluations.

Assessment: All four indicators had at least 8 of 10 teams achieving the desired level. A couple of teams performed below expectations in multiple indicators, particularly with regard to management. Two teams had average scores above 4 and exceeding expectations.

Proposed Action: Inclusion of some sort of peer review with groups along with more formalized tracking of planning meetings would be useful. Consider plans for extra intervention with teams that are not functioning as well.

Comments: First time assessing this class/outcome in new assessment plan. Artifact documents can be found (Panel assessments) in SLO 2 folder.

	Unsatisfactory	Marginal	Good	Excellent	Outstanding
Team Management	Team fails repeatedly in terms of preparation, work structure, work expectations, and maintaining schedules.	Team has lapses in preparation, work structure, work expectations, and maintaining schedules which are sometimes allowed to linger.	Team has lapses in preparation, work structure, work expectations, and maintaining schedules, but consistently corrects these issues in a prompt fashion.	Team is mostly prepared, mostly follows a defined work structure and expectations, and is generally on schedule.	Team is consistently prepared, has a defined work structure and expectations, and is on or ahead of schedule.
Collaborative Work	Some team members are effectively excluded from participating in project planning, development, and work.	The full team does not regularly participate in project planning, development, and work efforts, with consistent unevenness in contributions.	All team TJ 0 Tc 0 T dev eff0967.1 (r)-4.4 prent		

Requirement Definition		
Key Design Drivers, Primary Requirements, Derived Requirements, Requirement Verification		
Project Model		
Need Identification, Business/Project Case, Heritage/Peer Competitor Designs, Market/Customers, ValueProposition, Awareness of Broader Impacts		
System Development and Design		
Overall Vehicle Concept including subsystem desig Vehicle Layout with Critical Dimensions and Interfaces, Identification of Critical Components		

March 2023

Student	Library Assignment (Part 2: Bibliography) (225	
Points Possibl	90	
AE1	85	Meets Expectations
AE2	66	Does Not Meet Expectatio

Second Research Question The research question is a) relevant to your part of the project, b) involves a question to be answered or something to be learned, and c) is narrow enough that it can be resolved with a search.	6 pts Full Marks	5 pts Some answers are incomplete or missing	4 pts Mostly there	2 pts Lots of missing items	0 pts Didn't do this	6 pts
Third Research Question The research question is a) relevant to your part of the project, b) involves a question to be answered or something to be learned, and c) is narrow enough that it can be resolved with a search.	6 pts Full Marks	5 pts Some answers are incomplete or missing	4 pts Mostly			

Implemented the Style consistently	6 pts Full Marks	5 pts

Learning Outcome: 1 (Solve Problems using SEM) 2 (Design in Global Context) 3 (Effective Communication)
[select 1] 4 (Ethics in Global Context) 5 (Functional Teamwork) 6 (Experiment and Draw Conclusions)
7 (Lifelong Learning)

Course: AENG 3150 (Astrodynamics) (Spring 2023)

Location in Program Early Middle End

Outcome to Assess an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Method: Students are assigned an open-ended case study to choose an aerospace contractor or a space mission and answer specific questions. These questions require that the students pull information from a variety of sources (technical, financial, biographical).

Rubric Students are assessed on their ability to find and cite sources concerning technical, financial and biographical information, and to interpret that information to answer questions.

Desired result 70% of students will score at least 80% on the rubric.

Student performance 21 of 25 students met expectations (84%)
- 19 of 25 students exceeded expectations (scored > 90%)
4 students did not meet expectations
- 3 of those students did not participate
- 1 student participated but did not meet expectations

Observations
- The student who did not meet expectations did not read the instructions; they chose to use their own template and did not address the questions.
- When given specific questions to answer, students are able to find basic sources of information and answer questions about it.
- Given that the overwhelming majority of students exceeded expectations, it may be worthwhile to further refine the rubric. There's not much that can be gleaned from the information as is.

Program Assessment Is this an outlier (small sample size) or a cause for concern?

Action: Further refine the rubric

Copy of the assignment
Case Study of Spacecraft Contractor.

- Topic [1 pt]: Find a space mission or contractor that interests you. Please review the other parts of the assignment before settling on a topic. If you cannot find sufficient information, you will need to change topics.
    - A contractor is an organization that builds all or part of a space mission, such as: the spacecraft, the reaction wheels on the spacecraft, the launch vehicle, the on-board thrusters, the mission control center.

- Examples:
    - Missions: Galileo, OneWeb [the constellation], Curiosity, Ingenuity, MEV-1
    - Contractors: OneWeb [the company], SpaceX, Blue Canyon, Virgin TT331

Requirement Definition		
Key Design Drivers, Primary Requirements, Derived Requirements, Requirement Verification		
Project Model		
Need Identification, Business/Project Case, Heritage/Peer Competitor Designs, Market/Customers, ValueProposition, Awareness of Broader Impacts		

Category	Evaluation (1 to 5or NA)	Comments
Presentation/Communication Skill		
Speaks clearly, audibly, and directly to the audience		
Presents ideas in a wellorganized and clear manner		
Communicates with audio / visual aids, including cleargraphics & models / demonstrations		
Presents in a professional manner including vocabulary, language style, and appearance		
Responds effectively to questions		
Demonstrates collaborative work activity and project focus		

Quality of Overall Presentation [4 re f 259 47 1

2 1 2 . 3 m (4 1 5 (n) 1 3 . 1