Institutional Effectiveness

2023-2024

Program: Computer Engineering BSCMPE
College and Department: College of Engineering, Computer Engineering
Contact: Dr. Indranil Bhattacharya
Mission:
Provide quality undergraduate and graduate education and perform research in the areas of electrical and computer engineering to enhance the competitiveness of our graduates and contribute to economic, scientific, and social development.

Attach Curriculum Map (Educational Programs Only):
Attached Filed: See Appendix 1

SLO1: Identify, Formulate and Solve Engineering Problems

Define Outcome:

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

Assessment Methods:

1. Capstone Assessment (Survey)
2. Capstone Assessment (Reviewer)
3. Final Exam Assessment (Through Fall 2020)
4. Student Outcome Assessment (Beginning Spring 2021)
5. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

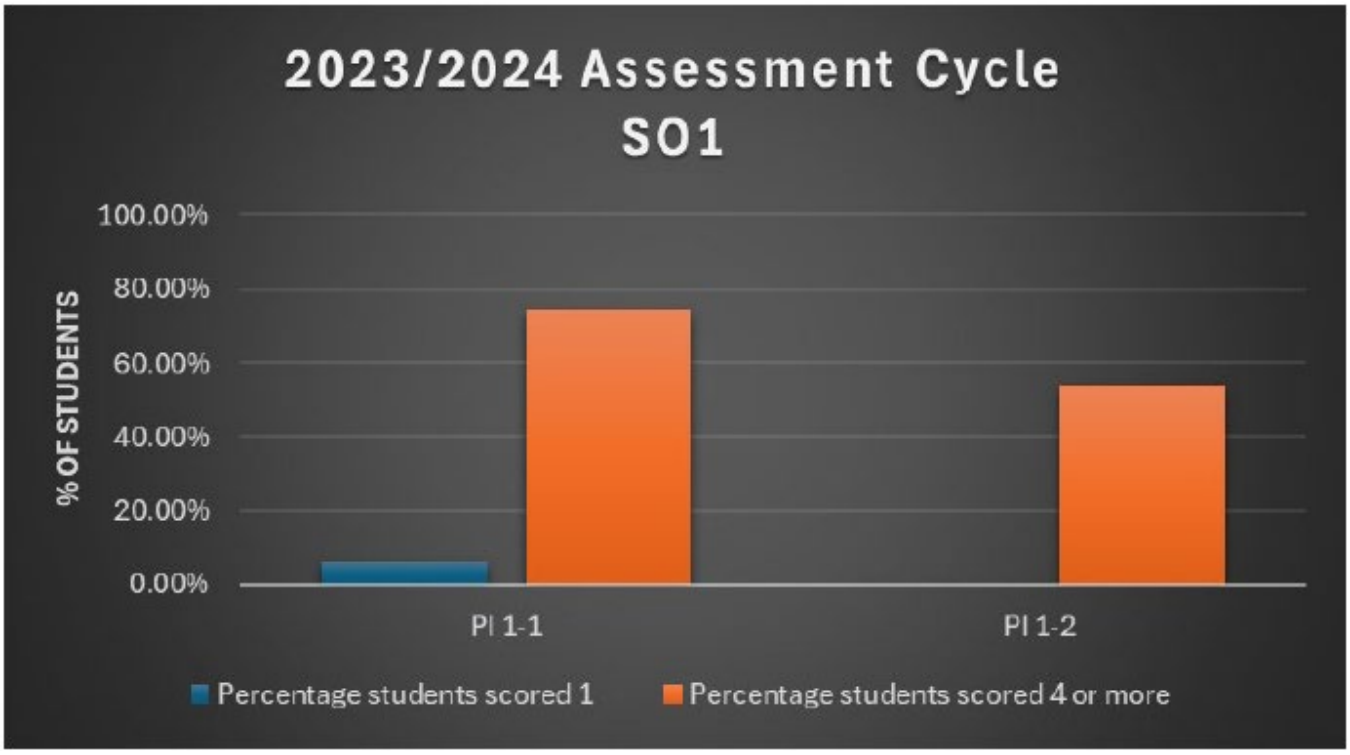
1. Capstone Assessment (Survey)
2. Capstone Assessment (Reviewer)
3. Final Exam Assessment (Through Fall 2020)
4. Student Outcome Assessment (Beginning Spring 2021)
5. Senior Exit Survey

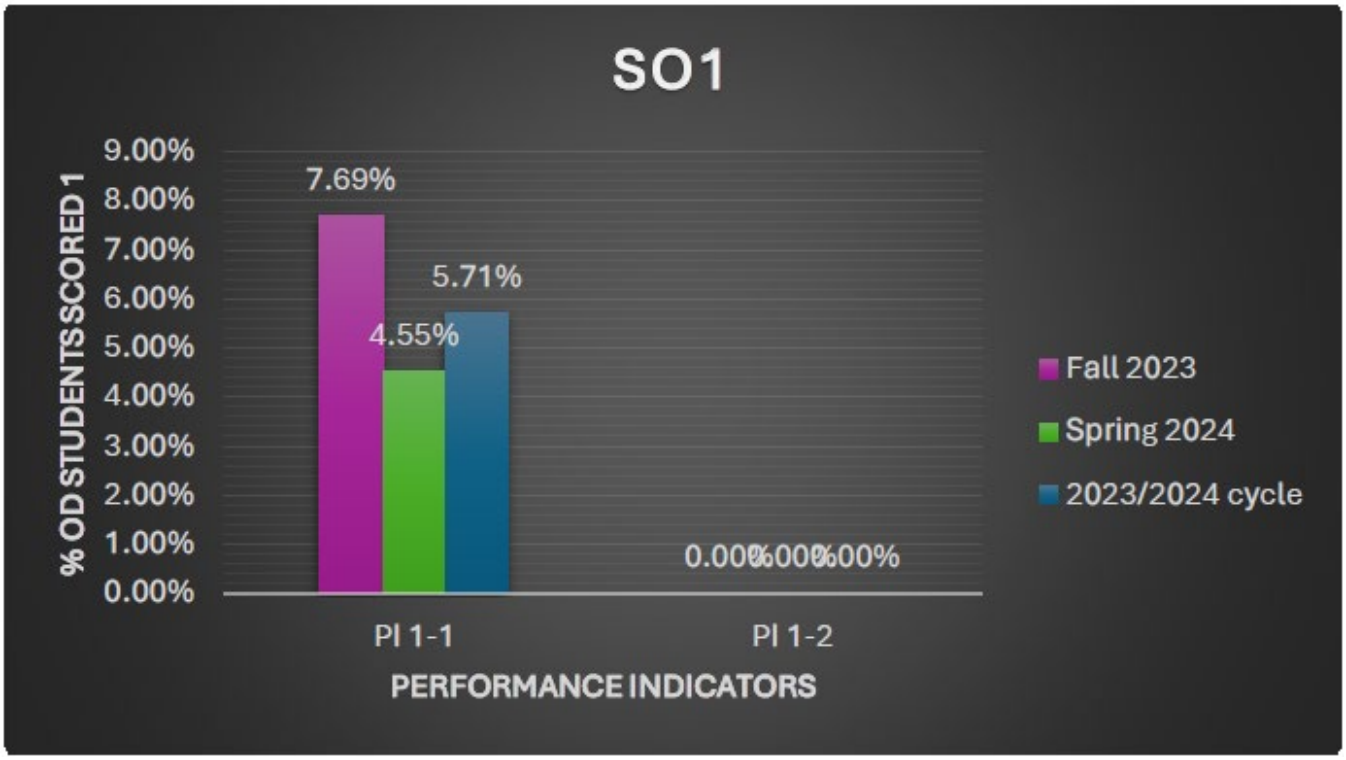
The raw data from most tools is obtained on a 1-5 scale with 5 being the best score. For the final exam assessment, scores on selected exam questions are reported out of 100%. For comparability, we translate this into a 5-point scale with the formula X/20, this translates into an average grade of 60 on the selected exam problems receiving a 3.0, the threshold for acceptability on our 5-point scale.

Our target for each student outcome and each assessment tool is to achieve greater than 3.5 out of 5. We categorize the attainment of each outcome using each assessment tool as:

- Highly Satisfactory (HS) if the rating is 3.75 or above,
- Satisfactory (S) if the rating is between 3.00 and 3.74,
- Unsatisfactory (U) if the rating is less than 3.00.

Results and Analysis:





Use of Results to Improve Outcomes:

Suggestions for performance improvement:

- Increase the amount of hands-on outside of the lab, such as ungraded assignments that will challenge the students and increase their motivation. I suggest the instructor also link the theory with the hands-on in the lecture to help the students understand how hardware is used using a programming language like C. I suggest a web site similar to https://wokwi.com which help them to visualize before the implementation.
- Conduct tutorial to show students how to connect the boards to their computers as well as downloading the software and drivers
- Remove the cache memory from the course as preparing the student to complete the 3 phases of the project could be better than teaching the memory during the last 2 weeks.

SLO2: Apply Engineering Design to Produce Solutions That Meet Specified Needs

Define Outcome:

Students will demonstrate an ability to 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 factors.

Assessment Methods:

1. Capstone Assessment (Survey)
2. Capstone Assessment (Reviewer)
3. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

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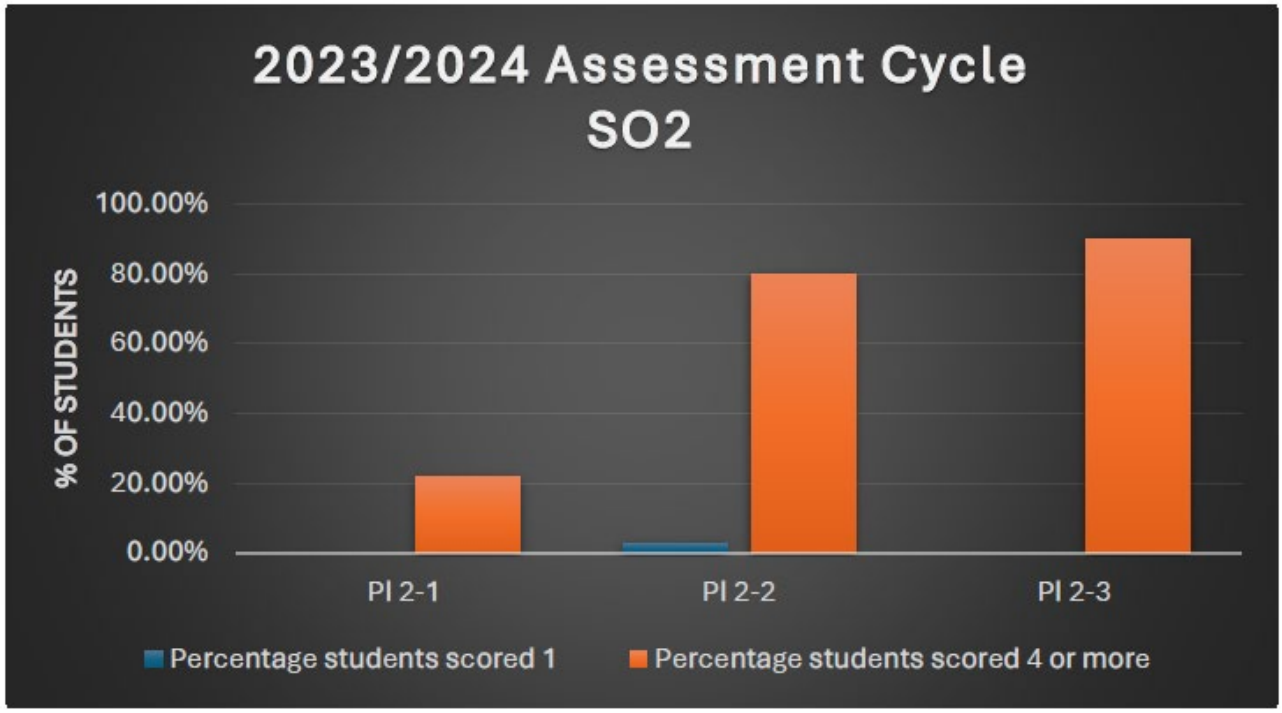

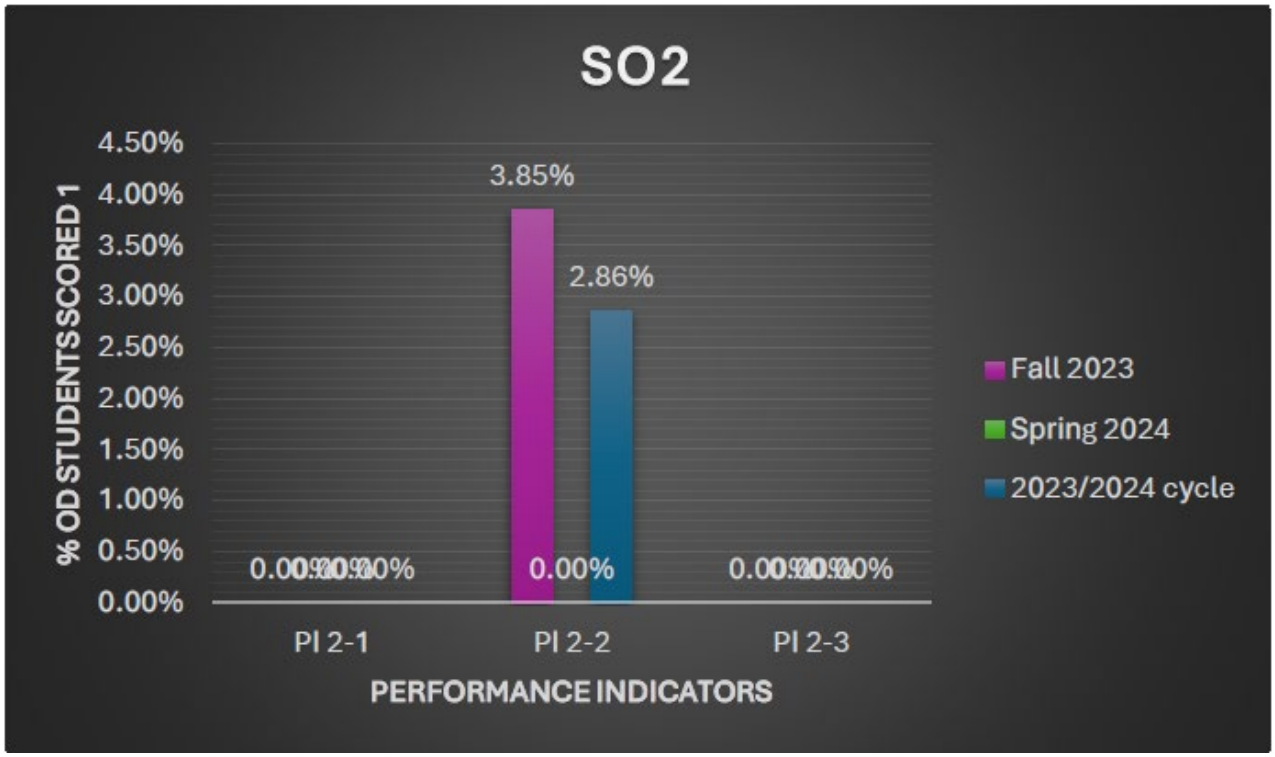

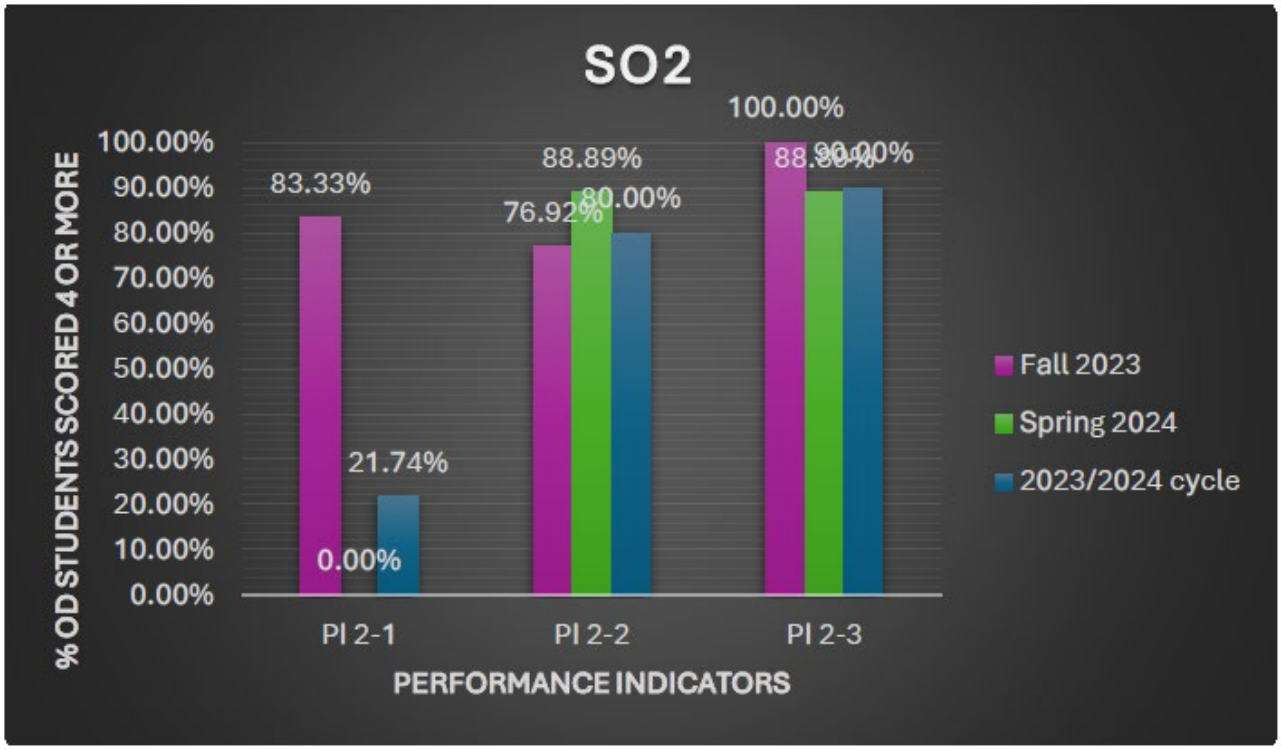

Use of Results to Improve Outcomes:

Suggestions for performance improvement:

- Review the syllabi of both ECE 2050 and ECE 3050
- Revise the lab material of ECE 3050
- Review curriculum to solve the issue of ECE 3050 course heavy content
- Students should learn relevant simulation tools before taking the class.
- It is recommended that, through advising, the fall and spring offerings of ECE 1000 are better balanced

SLO3: Communicate Effectively

Define Outcome:

Students will demonstrate an ability to communicate effectively with a range of audiences.

Assessment Methods:

1. Capstone Assessment (Survey)
2. Capstone Assessment (Reviewer)
3. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

1. Capstone Assessment (Survey)
2. Capstone Assessment (Reviewer)
3. Senior Exit Survey

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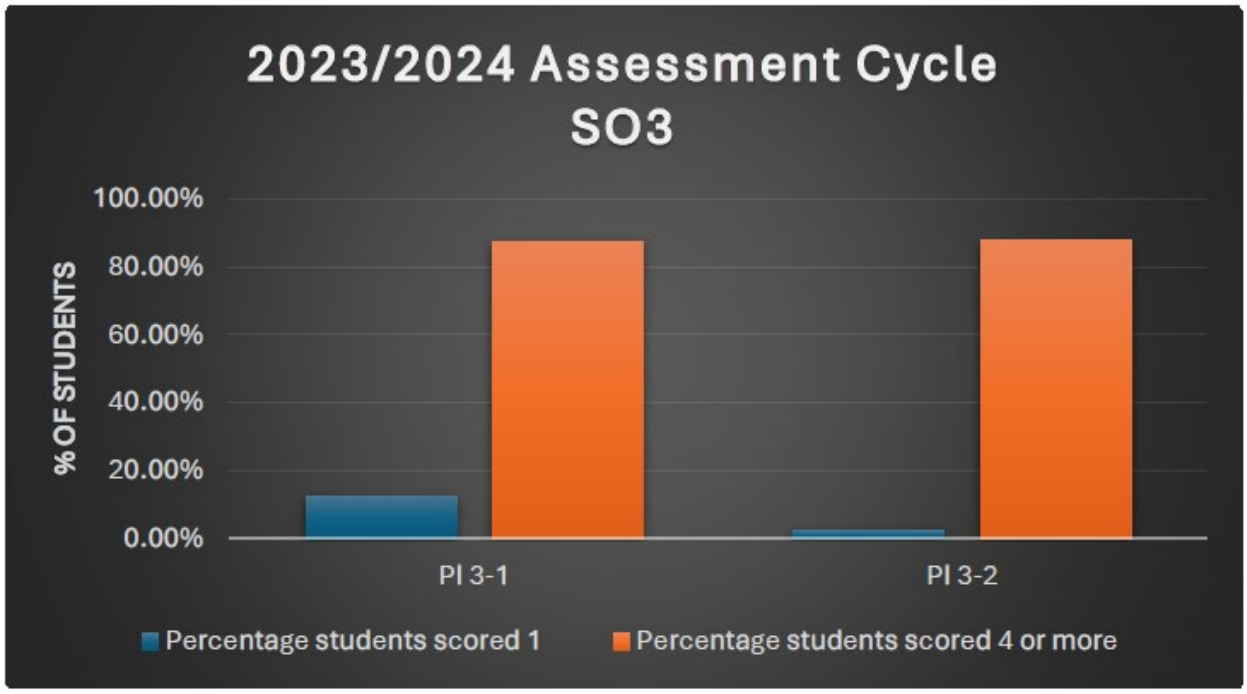

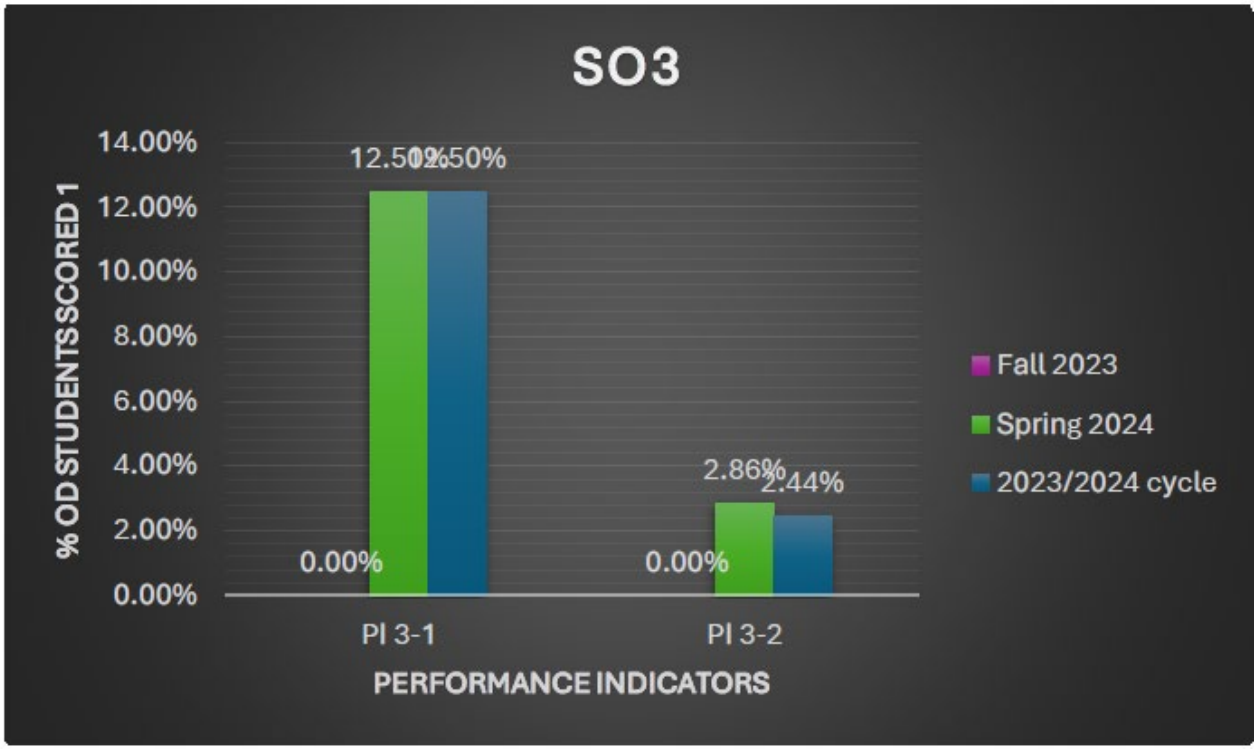

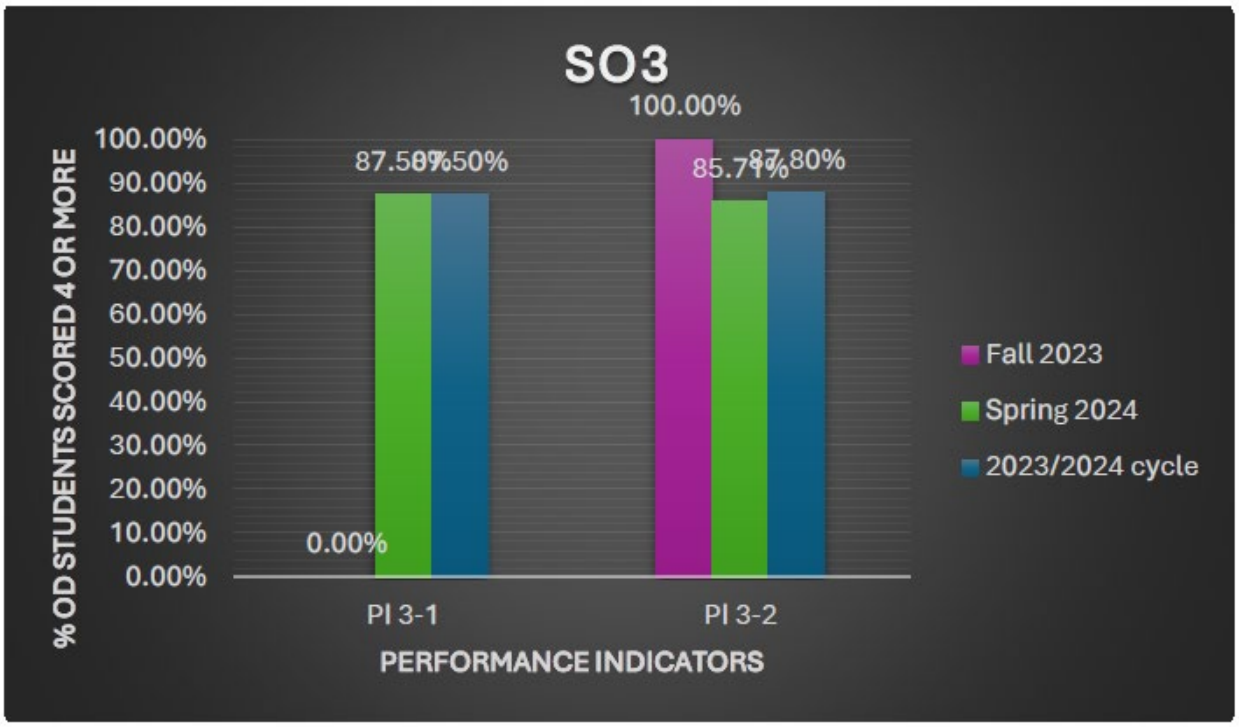

Use of Results to Improve Outcomes:
Even though the performance indicators reached their defined targets it is essential to try to improve the students' communication skills by giving them the opportunity to speak with hard time constraints, on a specific topic, in prior coursework with detailed feedback along multiple dimensions of communication. Also, the instructors suggest providing students with a template of a report including required sections with a clear rubric showing how the report will be assessed.

SLO4: Recognize Ethical and Professional Responsibilities and Make Informed Judgments

Define Outcome:

Students will demonstrate 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 Methods:

1. Capstone Assessment (Reviewer)
2. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

1. Capstone Assessment (Reviewer)
2. Senior Exit Survey

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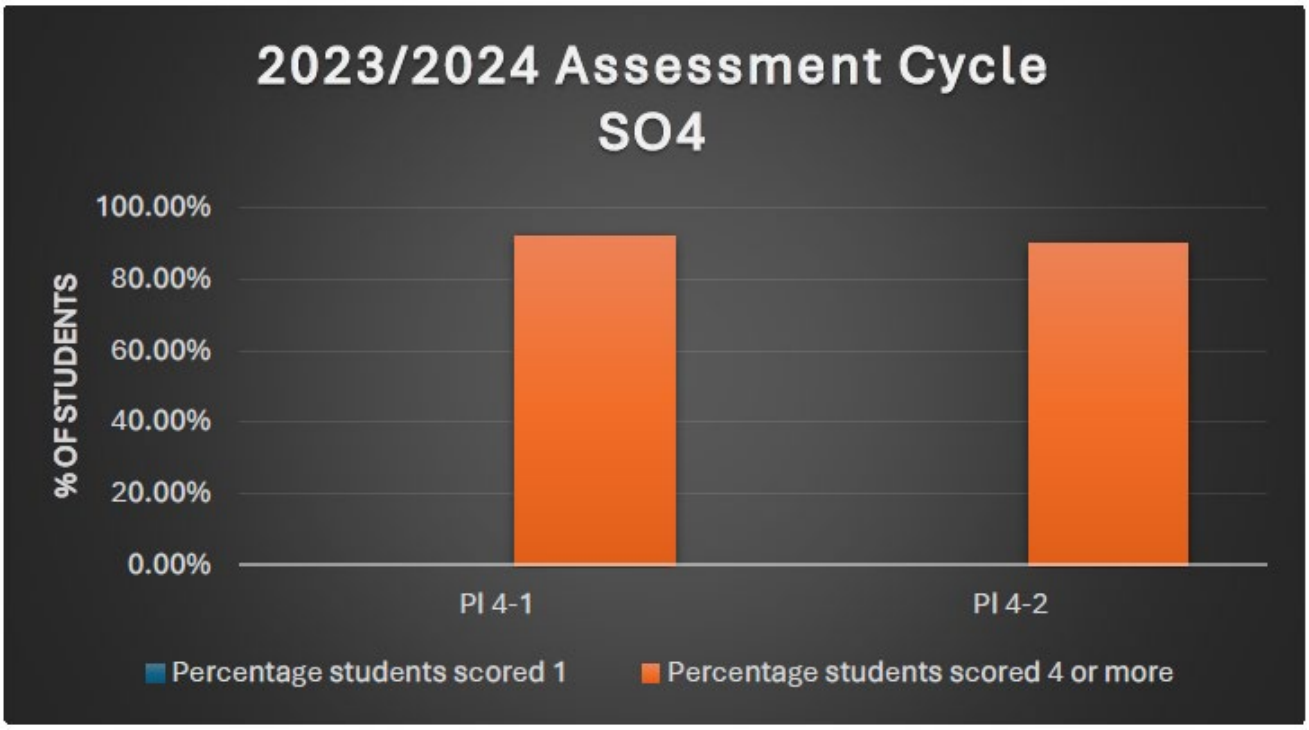

Use of Results to Improve Outcomes:

Suggestions for performance improvement:

- Continue monitoring these PIs.
- Talk to the students about methods to address ethical concerns.

SLO5: Teamwork

Define Outcome:

Students will demonstrate 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.

Assessment Methods:

1. Capstone Assessment (Reviewer)
2. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

1. Capstone Assessment (Reviewer)
2. Senior Exit Survey

The raw data from most tools is obtained on a 1-5 scale with 5 being the best score. For the final exam assessment, scores on selected exam questions are reported out of 100%. For comparability, we translate this into a 5-point scale with the formula X/20, this translates into an average grade of 60 on the selected exam problems receiving a 3.0, the threshold for acceptability on our 5-point scale.

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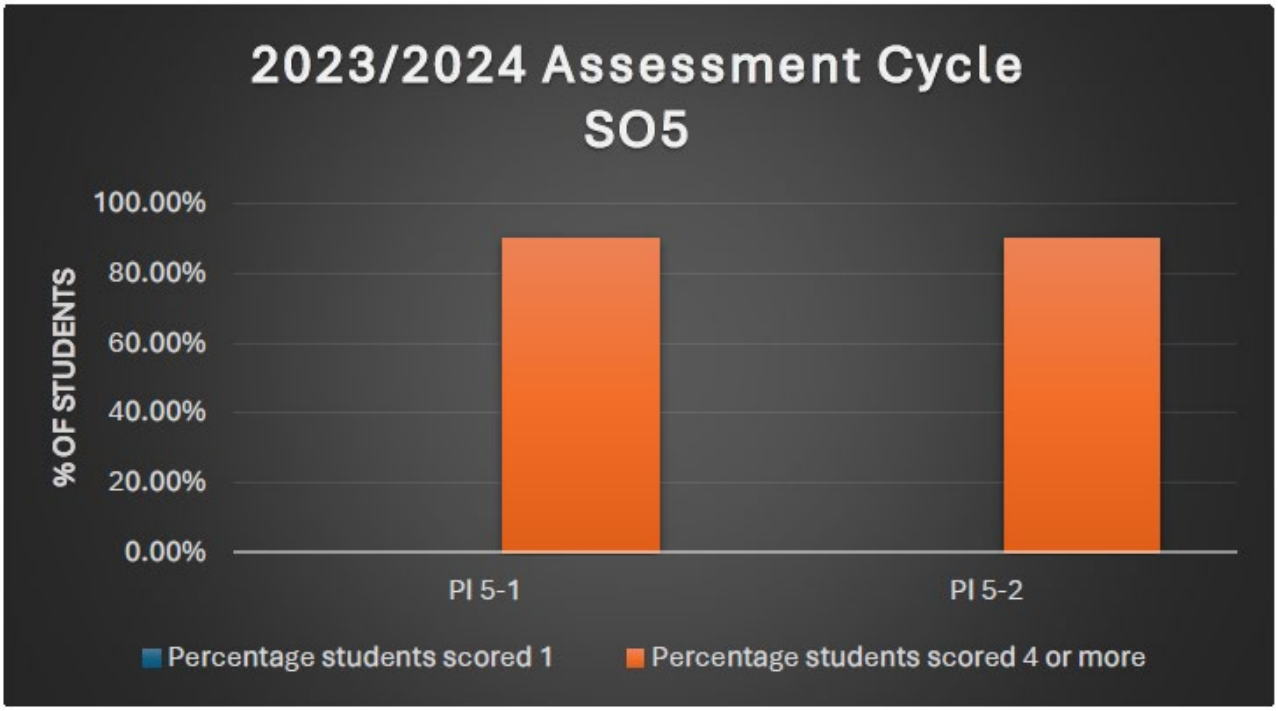

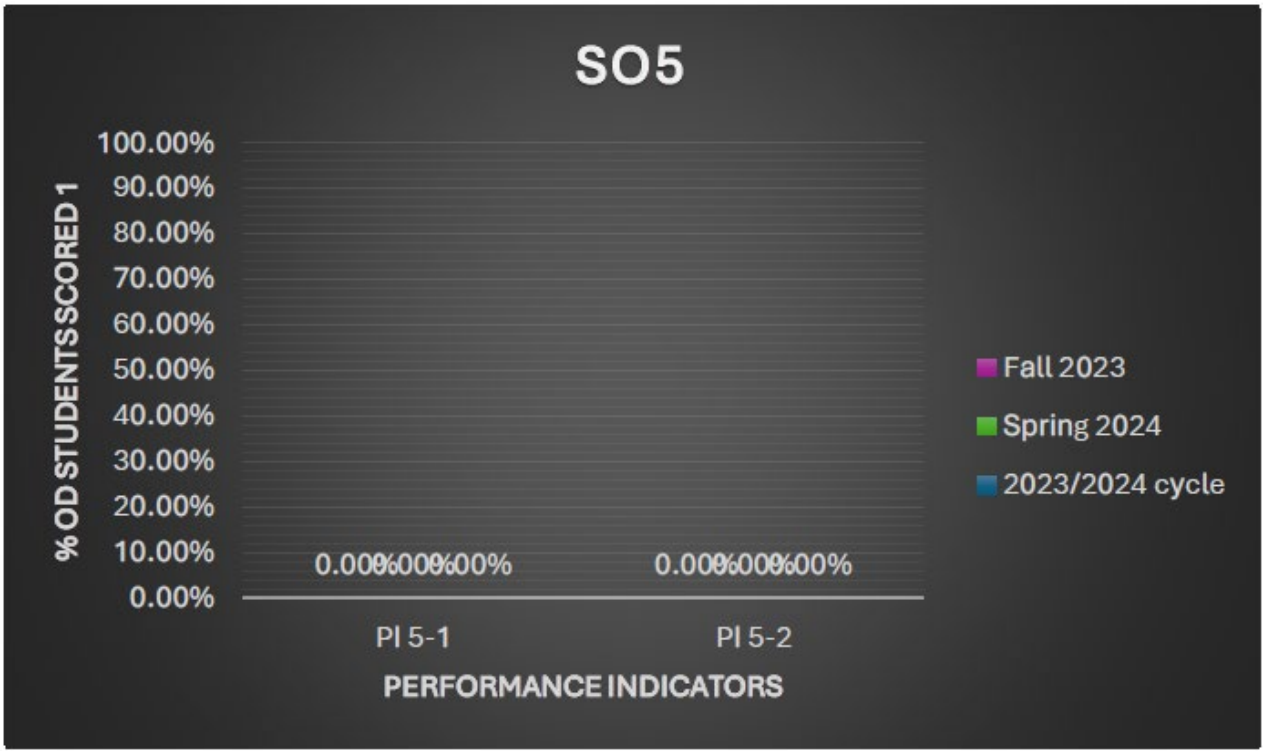

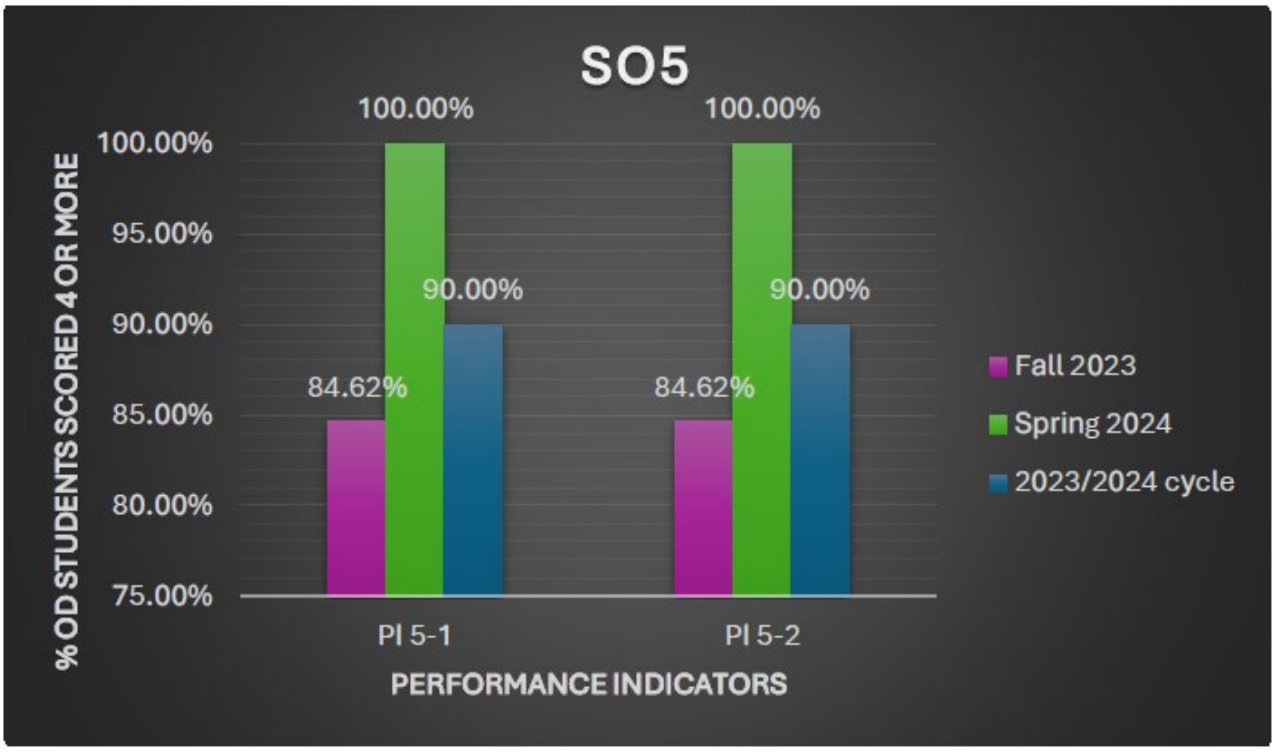

Use of Results to Improve Outcomes:

The instructor suggested adding more requirements to the labs by redesigning the labs assignments to increase the hands-on experience of the students with the boards.

SLO6: Experiment, Interpret Data, and Use Engineering Judgment

Define Outcome:

Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.

Assessment Methods:

1. Laboratory Assessment (through Fall 2020)
2. Student Outcome Assessment (beginning Spring 2021)
3. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

1. Laboratory Assessment (through Fall 2020)
2. Student Outcome Assessment (beginning Spring 2021)
3. Senior Exit Survey

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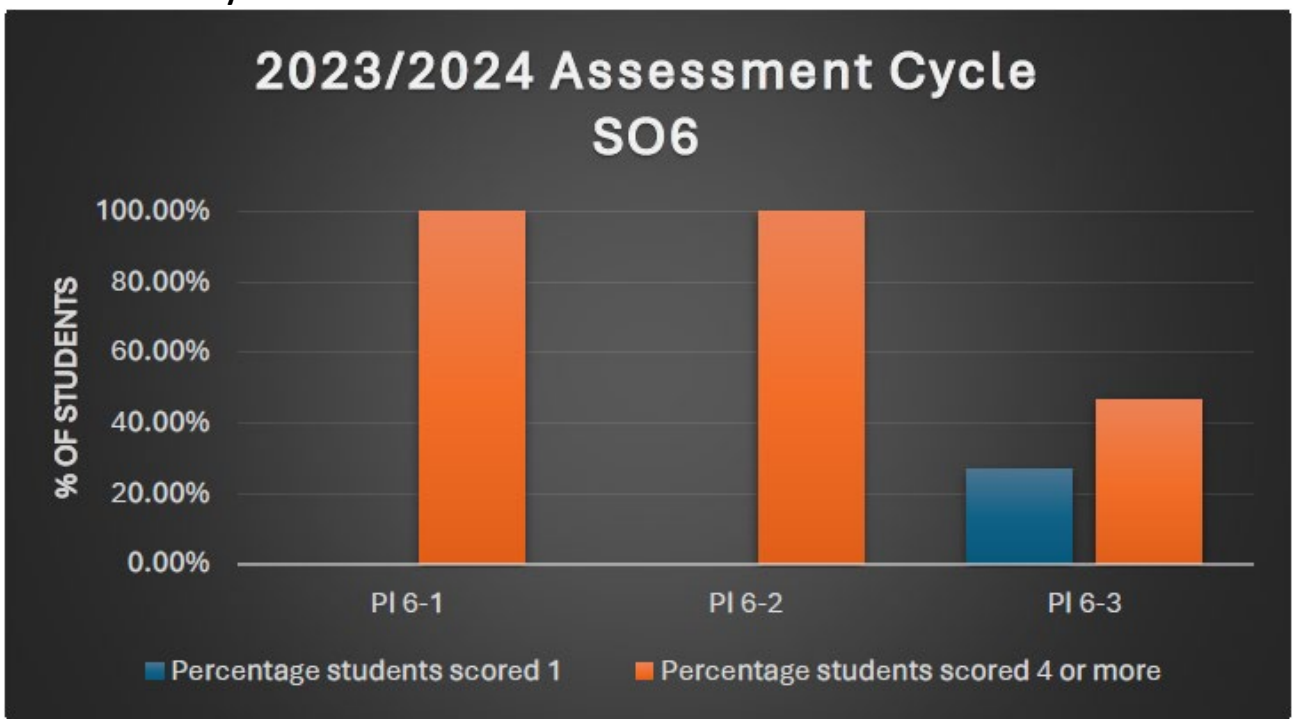

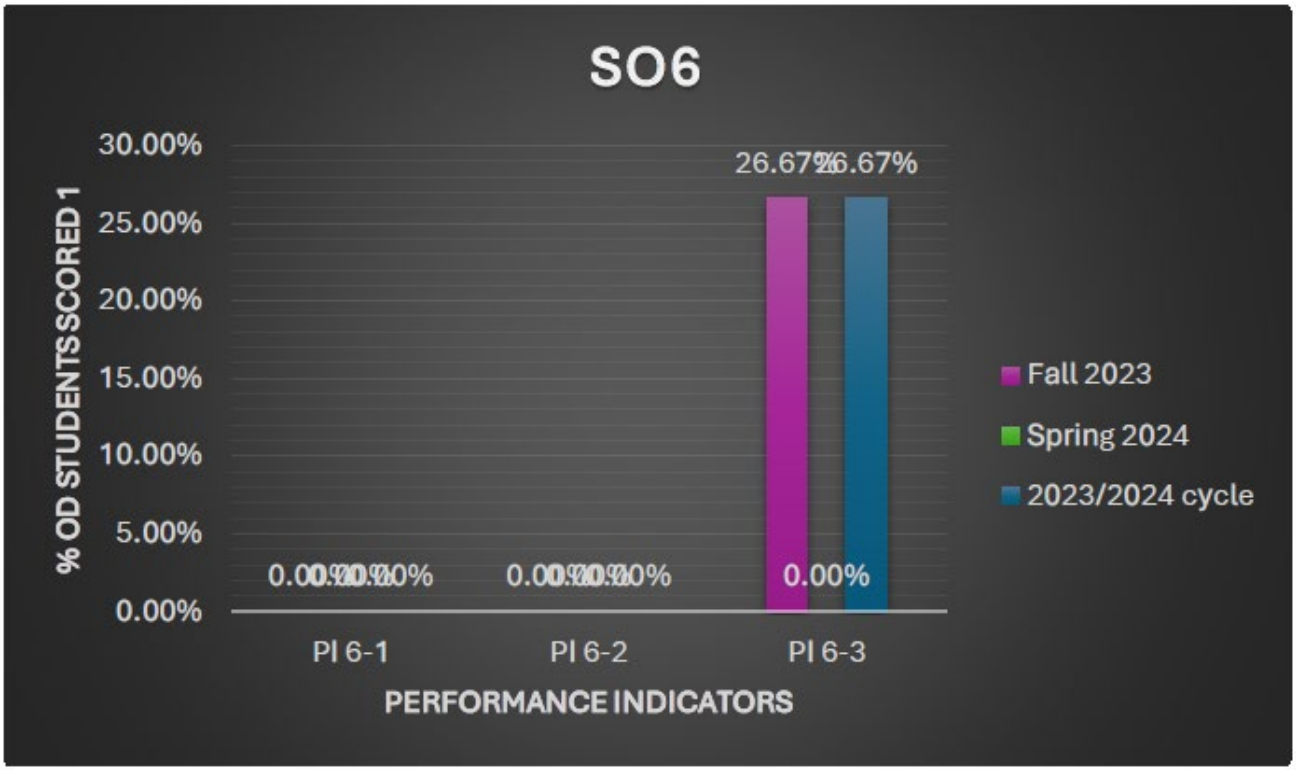

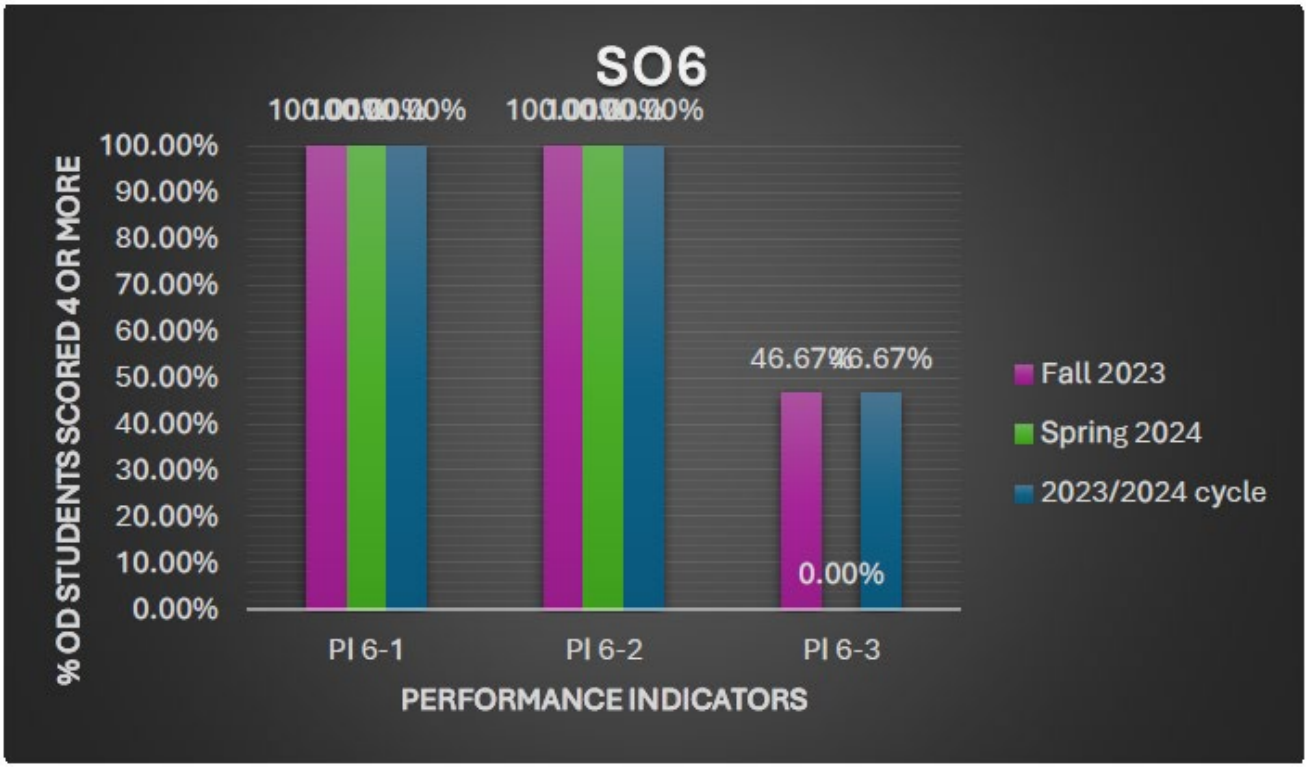

Use of Results to Improve Outcomes:

Suggestions for performance improvement:

- Train the students to use LTSpice and a bit of MATLAB during a dedicated set of either lab sessions or tutorials
- Review the curriculum for the ECE 2050 and ECE 3050 as well as the ECE 3330 courses

SLO7: Ability to Acquire and Apply New Knowledge

Define Outcome:

Students will demonstrate an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Assessment Methods:

1. Capstone Assessment (Reviewer)
2. Student Outcome Assessment (beginning Spring 2021)
3. Senior Exit Survey

Criteria for Success (Thresholds for Assessment Methods):

1. Capstone Assessment (Reviewer)
2. Student Outcome Assessment (beginning Spring 2021)
3. Senior Exit Survey

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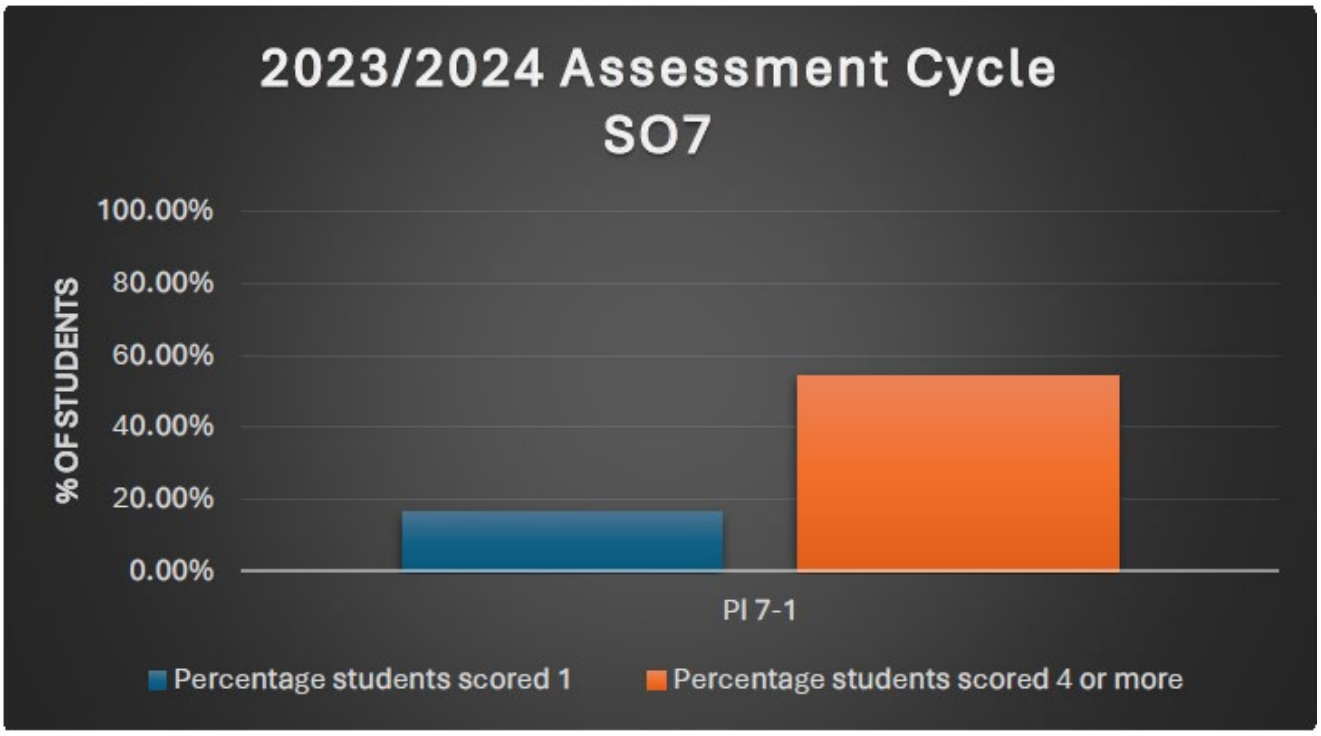
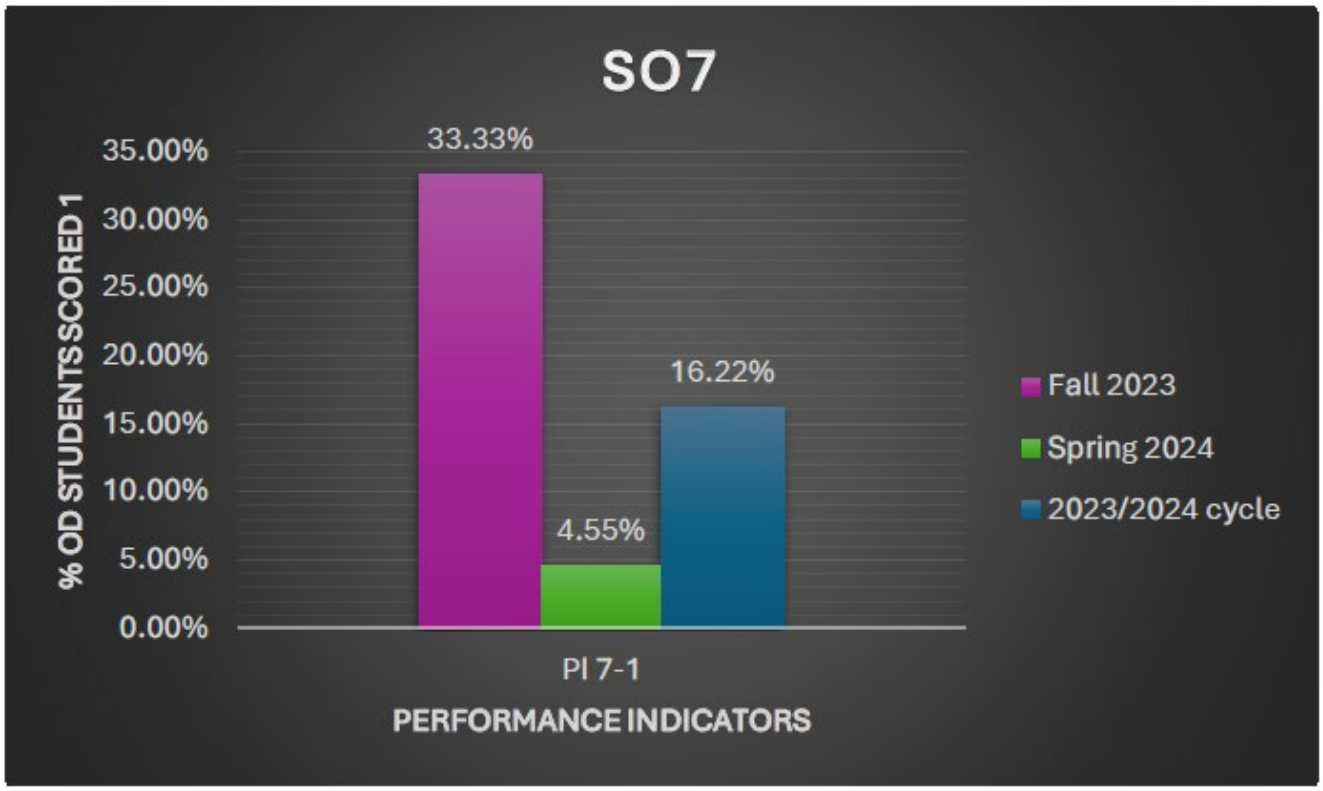
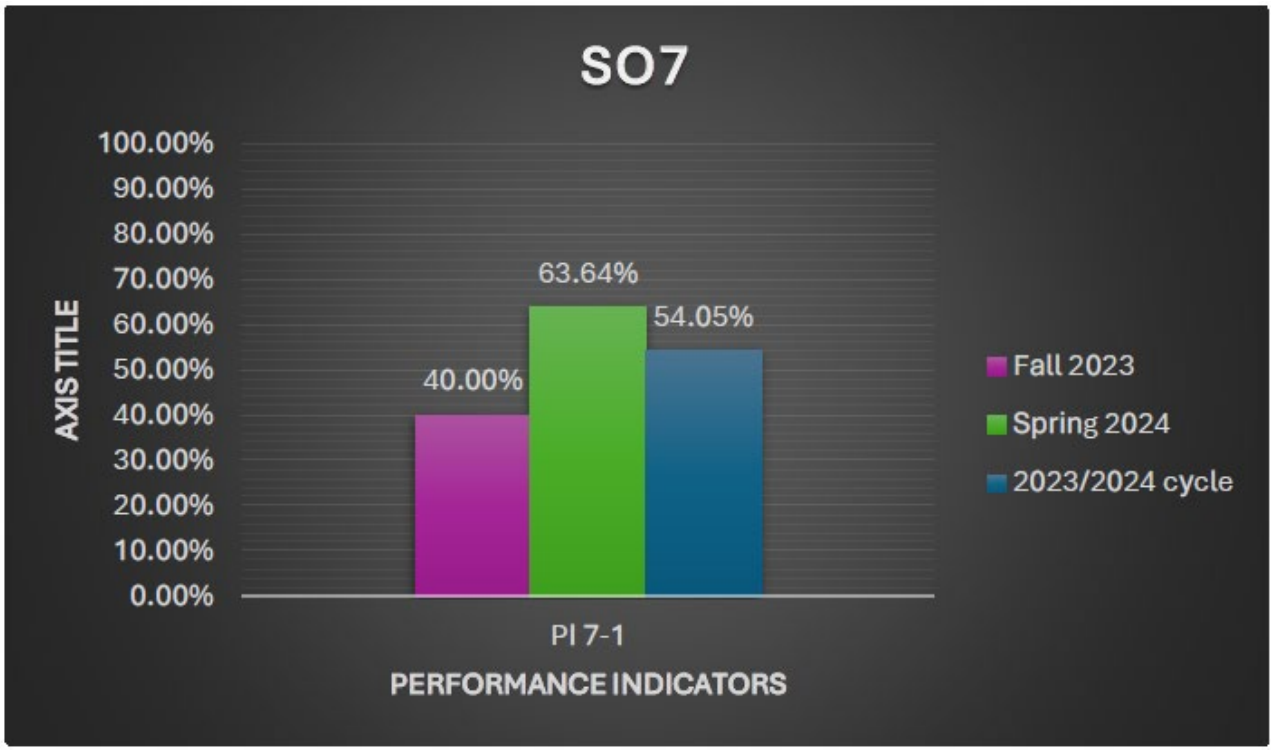
Results and Analysis:







Use of Results to Improve Outcomes:

Suggestions for performance improvement:

- Review the curriculum for the ECE 2050, ECE 3050 and ECE 4050 as well as the ECE 3330 courses

Summative Evaluation:

SLO 1: Increase the amount of hands-on outside of the lab, such as ungraded assignments that will challenge the students and increase their motivation. I suggest the instructor also link the theory with the hands-on in the lecture to help the students understand how hardware is used using a programming language like C.

SLO 2: It is recommended that, through advising, the fall and spring offerings of ECE 1000 are better balanced

SLO 3: Even though the performance indicators reached their defined targets it is essential to try to improve the students' communication skills by giving them the opportunity to speak with hard time constraints, on a specific topic, in prior coursework with detailed feedback along multiple dimensions of communication.

SLO 4: Continue monitoring these PIs.

SLO 5: The instructor suggested adding more requirements to the labs by redesigning the labs assignments to increase the hands-on experience of the students with the boards.

SLO 6: Train the students to use LTSpice and a bit of MATLAB during a dedicated set of either lab sessions or tutorials.

SLO 7: Review the curriculum for the ECE 2050, ECE 3050 and ECE 4050 as well as the ECE 3330 courses

List of Appendices:

Appendix 1: Curriculum Map

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	Student Outcome (SO)		Performance Indicator (PI)	CmPE Program
SO 1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	**PI 1-1**	Identify, formulate complex engineering problems	3130, 3140, Capstone
		PI 1-2	solve a complex engineering problem	4120, Capstone
SO 2	An ability to 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 factors.	**PI 2-1**	An ability to apply engineering design to produce solutions that meet specified needs	3050, Capstone
		PI 2-2	The design considers public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Capstone
SO 3	An ability to communicate effectively with a range of audiences.	**PI 3-1**	An ability to communicate effectively with a range of audiences (oral presentation)	3920, Capstone
		PI 3-2	An ability to communicate effectively with a range of audiences (written report)	2140, 3050, Capstone
SO 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.	**PI 4-1**	An ability to recognize ethical and professional responsibilities in engineering situations, make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	3920, Capstone
SO 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.	**PI 5-1**	An ability to function effectively on a team whose members together, create a collaborative and inclusive environment and meet objectives	3130, Capstone
		PI 5-2	An ability to function effectively on a team whose members together to provide leadership, establish goals, and plan tasks	3130, Capstone
SO 6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	**PI 6-1**	Develop and conduct appropriate experimentation	3050, Capstone
		PI 6-2	analyze and interpret data	3050, Capstone
		PI 6-3	use engineering judgment to draw conclusions	Capstone
SO 7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	**PI 7-1**	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	2140, 3330, Capstone