



The Matthew R. Simmons
**WINDSTORM
CHALLENGE**

MICROCREDENTIAL

UMS Micro-credential Overview

Learn



Level 1 Badge



Practice



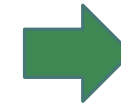
Level 2 Badge



Apply



Level 3 Badge



Certification



University of Maine System Micro-Credential

- Topic & theme introduction
- Foundational work
- Preparation for training

- Rigorous training
- Aligned quality standards
- Skill practice
- Competency assessment

- Work-based application
- On-the-job training
- Experiential learning
- Competency assessment

- Stacked Level 1-3 badges
- Automatic upon Level 3 issuance

Eligibility



High School students

- Any grade
- Non-school email address preferred



Parent/guardian permission

- To award badges via student non-school email
- To communicate about student micro-credential work



Educator participation

- Deliver content and direct assignments
- Assess Level 2 assignments & design tasks

Note on Permission:

Micro-credential resource material can be used with all students, we only need permission to issue badges.

You will get a Permission Form to send to parent/guardians!

Micro-Badge Level Requirements Overview



- **Science & Engineering**
Exam- Score 80%



- **Earn Collaboration micro-badge**
 - Team Charter
 - Teamwork Behavior
- **Earn Creative Problem-Solving microbadge**
 - Problem Definition & Research
 - Design Process: Ideation, Selection & Testing Plan
 - Engineering Notebook



- **Participate in the Windstorm Challenge-** need competition scores for Design & Presentation
- **Windstorm Reflection** (written or oral) with minimum two categories scored Excellent and remaining scored Satisfactory



Micro-Credential Pathway Expectations Overview

Educator Expectations

- Register using the Google Form
- Send permission slips home
- Send signed permission slips to ASCC
- Teach curriculum to students
- Grade student projects

Student Expectations

- Have parents/guardians sign permission slip
- Complete required assignments for each level
- Work as a team
- Participate in the Windstorm Challenge

ASCC Expectations

- Create Google folders for each school and participant
- Support educators with curriculum implementation
- Award level badges and the full micro-credential as students earn them
- Grade the final reflection



Requirements- Level 1

Score 80 % on the Science & Engineering Exam

- **Exam is 20 multiple choice questions.** Covers material in:
 - (7) WC Curriculum: Renewable energy, wind potential & industry, platform terminology
 - (7) Science & Engineering Guide: Engineering Design Process, Newton's Laws, force diagrams
 - (6) Buoyancy & Stability PPT: Offshore floating platform design physics, Archimedes' Principle
- Students **can retake the exam** until they get 80% if they want to earn the badge
- Link to Google Form here: <https://forms.gle/1TjWAsQg5bE8cgko9>



Educator Responsibilities

Help students learn quiz content

- You can use any previously identified resources to teach topics covered by the quiz
- Students can take quiz multiple times until they get the 80% needed to earn the badge

Learning resources

- Curriculum, Science & Engineering Guide, Buoyancy & Stability PPT
- Copy of Science & Engineering Quiz (email me for copy!)
 - Please do not give out to students as a study guide
 - Students can retake the online test as many times as needed to get to 80%



Example Quiz Questions

Windstorm Curriculum

Which clean energy sources use kinetic energy to generate electricity?

Hydro, wind, marine

Hydro, nuclear, bio

Wind, marine, solar

Marine, bio, geothermal

Buoyancy & Stability PPT

How can you increase the area waterplane moment of inertia?

Change the shape of the floating platform so that more area is away from the turbine.

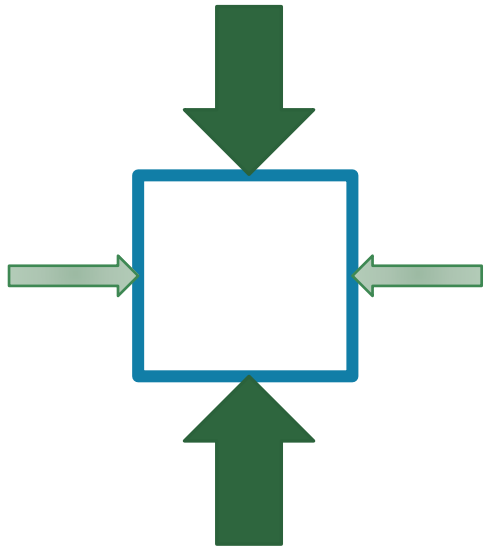
Increase the force due to gravity by adding extra mass to the platform.

Change the design of the wind blades to increase the force from the wind.

You can't, area waterplane moment of inertia is a fixed constant for seawater.

Example Quiz Questions

Science & Engineering Guide



How will the object in the image move assuming it started at rest?

It will not move because the forces acting on the object are balanced.

It will move up and down because those forces are larger than the left and right forces.

It will not move but it will be crushed by the up and down forces since they are so much larger than the left and right forces.

It will rotate since the left and right forces are unbalanced with the up and down forces.

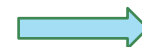
Requirements- Level 2

- Participate in a team in the Windstorm Challenge platform design process
- Earn Education Design Lab Collaboration micro-badge
- Earn Education Design Lab Creative Problem-Solving micro-badge



- **Collaboration micro-badge**

- Team Charter
- Teamwork Behavior



assignments are mapped
onto badge standards and
assessed using rubrics

- **Creative Problem-Solving microbadge**

- Problem Definition & Research
- Design Process: Ideation, Selection & Testing Plan
- Engineering Notebook





Educator Responsibilities

- **Guide students through the design process tasks**
 - Resources in Science & Engineering Guide
 - Assignments can be graded as part of classwork
 - Assignments can be modified to your specifications, but must still allow students to meet criteria for Collaboration and Creative Problem-Solving micro-badges
- **Assess assignments using the provided rubrics**
 - Rubric is simple meeting/not meeting format
 - Use your professional judgement
 - Ask me if you need additional guidance!



Rubric Examples

Team Charter

Criteria	Standard	Meeting	Not Meeting
Strengthen Relationships			
Discussion Practices	Outlines rules for discussions to allow all team members to contribute. Creates an open and candid environment for productive dialogue.		

Meeting: Charter **has rules** for how team will create a **positive environment** during team discussions



Each team member's opinion will be heard before making a decision.

You have to listen to the person's whole idea before commenting- no interrupting!

Not Meeting: Charter **has no rules** for team discussions or rules would create a **negative environment**



Everyone can propose an idea, but if it doesn't make sense, then the Team Leader can stop the discussion and make a decision.

Rubric Examples

Define & Research the Problem

Criteria	Standard	Meeting	Not Meeting
Divergent/Convergent Thinking			
Develops and Applies Criteria	Outlines criteria for including a specific floating model system (buoy, boat, etc) in research.		

Meeting: Outline **has criteria** for including model systems in research

✓ *I am going to include model systems that are designed to be relatively stationary in water, float, and are subjected to extreme weather variations.*

✓ *My model systems are a weather buoy, pool noodle, and boat because each floats independently in water but each have different properties like weight, material, and function that I want to explore.*

Not Meeting: Outline **has no criteria or ineffective criteria** for including model systems in research

✗ *I am using a speedboat as my model system.* → No criteria or reasoning. Only one model.

I will collect information on anything that floats. → Criteria too broad. Too many models would fit.



Requirements- Level 3

- **Participate with your team in the Windstorm Challenge competition**
 - Teams need scores for Design and Presentation sections
 - No minimum scores for Performance in the basin, no penalty if design doesn't work
 - Absent students can still earn Level 3 if they significantly contributed to competition prep, student must talk with team to understand scoring to complete the reflection assignment
- **Reflection assignment completed post competition**
 - Includes discussion of: Competition Debrief, Skill Assessment, Future Goals
 - Can be written or recorded, 750 words or 5 minutes
 - Must score Excellent in 2 categories with no scores of Unsatisfactory
 - Due May 28th (can extend if needed, but want to have completed before summer break!)



Educator Responsibilities

- **Assist students with the reflection process**
 - Provide feedback on early drafts
 - Help with submitting reflections
 - Facilitate feedback to students
 - Submissions due 2 weeks after the Windstorm Challenge competition
 - Students may **resubmit once** if reflection does not meet criteria, due 1 week after receiving feedback

[ASCC staff will score Final Reflections](#)



Rubric Examples

Criteria	Excellent	Satisfactory	Unsatisfactory
Platform Debrief	All aspects of the competition were addressed (technical, design, and presentation). Learner provided specific logical examples for improvement for each aspect.	All aspects of the competition were addressed (technical, design, and presentation). Learner provided specific examples for improvement for at least 2 aspects.	One or more aspects of the competition was not addressed. OR Learner provided less than two examples for improvement OR improvement ideas lacked detail.



Rubric Example- Excellent

Overall our team did pretty well in the Windstorm Challenge competition, we got 10th place overall, Go Team Windy! Our best score was in the **Design** section. The judges really liked our use of recycled aluminum cans as the base of the platform, but we lost points because some cans fell off and we had to reglue them so we should have spent more time trying to **figure out a better way to connect** everything. Or at least **cleaned up the glue drippings** at the repair station! The platform **performance** in the basin was good! It was so cool to see our model in action. Even though we had to reglue the cans, it didn't affect our model that much because everything stayed put, even if it was a bit sloppy. One thing that we could do better next time is **include some weight underneath** the platform to help stabilize it, it bobbed around a lot which wasn't good. We discussed doing that for this year but were worried that we would be over the weight limit. The **presentation** went better than I expected. I was really nervous, but the judges liked how our team worked together. We should have **practiced our speeches a little more** though, since we forgot things. I forgot to mention what inspired us to use the cans and we sometimes forgot who was supposed to say what.



All 3 sections of the competition are mentioned.

A logical example of how to improve the score in that section is included.



Rubric Example- Satisfactory

Overall our team did pretty well in the Windstorm Challenge competition, we got 10th place overall, Go Team Windy! Our best score was in the **Design** section. The judges really liked our use of recycled aluminum cans as the base of the platform, but we lost points because some cans fell off and we had to reglue them so we should have spent more time trying to **figure out a better way to connect** everything. Or at least **cleaned up the glue drippings** at the repair station! The platform **performance** in the basin was good! It was so cool to see our model in action. Even though we had to *reglue the cans, it didn't affect our model* that much because everything stayed put, even if it was a bit sloppy. The **presentation** went better than I expected. I was really nervous, but the judges liked how our team worked together. We should have **practiced our speeches a little more** though, since we forgot things. I forgot to mention what inspired us to use the cans and we sometime forgot who was supposed to say what.



All 3 sections of the competition are mentioned.

Specific examples for improved provided for 2 sections.

Improvement for the platform performance is not suggested. They state that the gluing on the cans did not affect performance so fixing that would not count as a way to improve the performance score.



Rubric Example- Unsatisfactory

Overall our team did pretty well in the Windstorm Challenge competition, we got 10th place overall, Go Team Windy! Our best score was in the **Design** section. The judges really liked our use of recycled aluminum cans as the base of the platform, but we lost points because some cans fell off and we had to reglue them so we should have spent more time trying to **figure out a better way to connect** everything. Or at least **cleaned up the glue drippings** at the repair station! The platform **performance** in the basin was good! It was so cool to see our model in action. Even though we had to *reglue the cans, it didn't affect our model* that much because everything stayed put, even if it was a bit sloppy.

- X** No discussion of presentation.
- Only lists improvement for one section.

The **presentation** went better than I expected. I was really nervous, but the judges liked how our team worked together. I forgot to mention what inspired us to use the cans and we sometimes forgot who was supposed to say what. *We will do better next year.*

- All 3 sections of the competition are mentioned.
- X** Still only lists improvement for one section.
- Presentation suggestions lacks detail. Need to explain what they will do to be better.*

Questions?



Contact me for help!

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Repaired Links- Science & Eng Guide

Newton's Laws

<https://www.khanacademy.org/science/hs-physics/x215e29cb31244fa1:forces-and-motion>

<https://www1.grc.nasa.gov/beginners-guide-to-aeronautics/newtons-laws-of-motion/#:~:text=What%20are%20Newton's%20Laws%20of,the%20amount%20of%20force%20applied>

UMaine 4H Toolkit Buoyancy Activity

<https://extension.umaine.edu/4h/stem-toolkits/offshore-wind/#activity-1-buoyancy>

Brainstorming Techniques

<https://www.wework.com/ideas/professional-development/creativity-culture/effective-brainstorming-techniques>