

ME 463 EXTERNAL COMPETITION PROJECTS

Associate director of senior design

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Mechanical Engineering

Senior Design
ME463

Participate in an external competition

SICK Lidar challenge

Overview

SICK is a leading global manufacturer of factory, logistics and process automation technology worldwide. The teams will be challenged to solve a problem, create a solution and bring a new application that utilizes the SICK scanner in any industry.

Themes

- Any new application and usage of LiDAR sensor for autonomy, solving customer problem, commercial potential, technical capabilities etc

Schedule

- Mid-September is to submit the application forms including abstract of the project proposal
- March-April of the following year is when you present your final design, prototype and presentation

Link

<https://www.sick.com/us/en/sick-10k-challenge/w/10K-Challenge>



Mechanical Engineering

Due date approaching soon! Interest student should contact Prof. Bae (ebae@purdue.edu)

Participate in an external competition

1 page flyer for UG blog



Mechanical Engineering

**PURDUE**
UNIVERSITY

Mechanical Engineering

**REPRESENT
PURDUE**
MECHANICAL ENGINEERING
SICK \$10K CHALLENGE

**360°
3D LiDAR**



**WIN UP TO
\$10,000**
★ ★ ★
1ST: \$10,000
2ND: \$5,000
3RD: \$3,000

ME463 CAPSTONE PROJECT TEAM
Join the selected team that will represent
Purdue Mechanical Engineering!

**APPLICATION DUE
MID-SEPTEMBER 2026**

IDENTIFY
A PROBLEM

DESIGN

BUILD

TEST

COMPETE

**360° 3D LiDAR**
Build around the
SICK multiScan100

**REAL PROTOTYPE**
Turn an original idea
into a working system

**ANY INDUSTRY**
Robotics • Automation
Manufacturing • Mobility
Agriculture • Smart Infrastructure

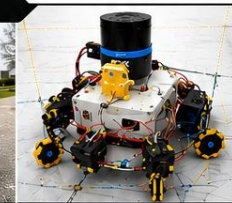
**NATIONAL COMPETITION**
Represent Purdue
Mechanical Engineering

WHAT COULD YOU BUILD WITH 3D LiDAR?

**Autonomous
Mobile Robots**

**Compact
Mobile Platforms**

**Off-Road
Robotic Platforms**

**Student-Built
Systems**

Examples from previous SICK \$10K Challenge teams

**JUDGED ON
WHAT
MATTERS**

Creativity &
Innovation

Solve a Real
Customer Problem

Commercial
Potential

Entrepreneurship
of the Team

Technical
Capability

Unique LiDAR
Application

**INTERESTED IN JOINING
THE PURDUE TEAM?**

- ✓ Work on a real, cutting-edge project
- ✓ Build valuable skills and your portfolio
- ✓ Compete for cash prizes and recognition
- ✓ All while representing Purdue!

**CONTACT
PROF. EUIWON BAE**
Purdue University
School of Mechanical Engineering
✉ ebae@purdue.edu
Send a short description of your idea
and why you want to participate.

**LEARN MORE ABOUT THE
SICK \$10K CHALLENGE**

SICK \$10K
challenge

Participate in an external competition

NASA RASC-AL competition (2027)

Overview	The NASA Revolutionary Aerospace Systems Concepts – Academic Linkage (RASC-AL) Competition fuels innovation for aerospace systems concepts, analogs, and technology prototyping by bridging gaps through university and college engagement.
Themes	• ENABLING EXTREME EXPLORATION • TRANSIT PATHWAY CONSTRUCTION • LUNAR RESOURCE EXPLORATION • SMART/RESILIENT • LUNAR HABITAT
Schedule	Phase 1 – Oct. 13, 2026 Notice of intent Feb. 23, 2027 Submit proposal package Phase 2 – June 3, 2027, Submit technical paper
Link	https://rascal.nianet.org/wp-content/uploads/2027-RASC-AL-Competition-Guidelines.pdf

Participate in an external competition

NASA Blue skies competition (2027)

Overview	NASA's Blue skies competition invites collegiate-level student teams will conceptualize innovative airborne platforms for inspecting land-based (i.e., hard) infrastructure that can be implemented by 2035 or sooner with the goal of improving safety, reliability, efficiency, and cost.
Themes	• 2027 theme : InfraAir: Aviation for Infrastructure Inspection • Operational Environments & Conditions • Inspection Targets & Methods • Data Integration & Advanced Capabilities
Schedule	Phase 1 – Oct. 12, 2026 Notice of intent Feb. 22, 2026 Submit proposal and video Phase 2 – May 10, 2026, Submit final paper and infographic
Link	https://blueskies.nianet.org/wp-content/uploads/2027-GBS-Guidelines.pdf

Participate in an external competition

NASA HuLC challenge – 2027 schedule TBA

Overview	NASA's 2026 Human Lander Challenge (HuLC) invites collegiate student teams to develop innovative, systems-level solutions that improve critical aspects of Environmental Control Life Support System (ECLSS) performance
Themes	• Noise Suppression and Control • Sensor Reduction in Hardware Health Monitoring Systems • Potable Water Dispenser • Fluid Transfer Between Surface Assets on the Moon and Mars
Schedule	Phase 1 – Oct. 20, 2025 Notice of intent Mar. 4, 2026 Submit proposal package Phase 2 – May 27, 2026, Submit technical paper
Link	https://rascal.nianet.org/competition-details/



Mechanical Engineering

Participate in an external competition

Aerospace Propulsion Outreach Program (APOP)

Overview It allows students an opportunity to work with Air Force engineers and challenges them to modify small gas turbine engines and innovate on current turbine engine designs.

Themes

- Small gas turbine engine design, prototype and related technologies

Schedule

- May 31st deadline for entry to 2026-2027 program

Link <https://afresearchlab.com/apop-propulsion-outreach-program-2026/>



Mechanical Engineering

Participate in an external competition

ASME/SME Student Manufacturing Design Competition

Overview	The purpose of the competition is to foster interest in manufacturing, provide the manufacturing engineering community with fresh new perspectives on design, and create a forum for students to share their new and innovative ideas.
Themes	Digitally integrated manufacturing; Robotics and automation; Additive and subtractive operations; Manufacturing systems innovations; Materials – process interaction; Energy-efficient manufacturing Any creative new way to make things!
Schedule	Entries from either teams or individual contestants must be submitted in electronic form to ihab.ragai@psu.edu and samuej2@rpi.edu received by March 16, 2026. Please make sure to receive a notice of receipt. Up to eight finalist teams will be selected from the entrants and will be expected to give an oral, in-person presentation at the 2026 MSEC/NAMRC 54 conference.
Link	https://namrc.sme.org/competitions/student-manufacturing-design-competition/

Participate in an external competition – Prof. Warsinger

Hydropower Collegiate Competition (HCC) 2026

Run through Dr. David Warsinger's Water Lab

Main Goal - Electrification of dams (Case Study)

1. the conversion of non-powered dams (NPDs) to hydroelectric dams,
2. the addition of pumped storage hydropower (PSH) to existing hydropower reservoirs, and
3. in-conduit hydropower

Organized by DOE, \$20k in funding for plan and demo

Last year team made their own turbine and won 'Best Design-Build' Award at National Competition



Mechanical Engineering



Hydropower
COLLEGIATE COMPETITION
U.S. DEPARTMENT OF ENERGY

Participate in an external competition – Prof. Warsinger

Please send inquiry to

- Note: Some competition information is based on 2025-26 academic year since the 2026-27 program has not been announced yet.
- Dr. Euiwon Bae, Associate director of Senior Design
- **ebae@purdue.edu**
- ME G082



Mechanical Engineering



Hydropower
COLLEGIATE COMPETITION
U.S. DEPARTMENT OF ENERGY

THANK YOU



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