

RICHARD J. FASENMYER

ENGINEERING DESIGN CONFERENCE

SATURDAY, MAY 3, 2025

ERIEZ

ERIEZ

OUTSTANDING CAPSTONE
PROJECT SPONSOR



SCHEDULE OF EVENTS

7:30 a.m.

Registration. Second Floor,
Burke Center

7:30–11:30 a.m.

Refreshments. 112 Burke

8:00–11:30 a.m.

Senior Presentations (half-hour
sessions including Q and A).

11:45 a.m.–12:15 p.m.

Keynote Speaker: David Boyce.
180 Burke

12:15–12:30 p.m.

Student and Sponsor Award
Presentations. 180 Burke

Class Pictures

Photos to be taken after awards in
following order: ME, CSSE, PLET, MET,
IE, ECE, ECET, IBE, ISB. Assemble in
hallway outside 180 Burke.

Reception

After the awards, join us in Clark Café
for an ice cream celebration!

KEYNOTE SPEAKER



David Boyce '01

President and CEO, Bloom Engineering Company Inc.

David Boyce is the president and CEO of Bloom Engineering Company Inc., a world leader in the design and manufacture of high-temperature, low-emissions industrial combustion systems. Headquartered in Pittsburgh since 1934, Bloom Engineering serves global customers in the steel and aluminum markets through subsidiaries in Germany, India, and China.

As a student at Penn State Behrend in 1998, Boyce gravitated toward the heat transfer and thermal systems side of mechanical engineering. He was the first co-op student with what was then Aalborg Energy (now John Cockerill), one of the first tenants at the newly built Knowledge Park.

After graduating from Behrend with a degree in Mechanical Engineering in 2001, Boyce worked in various engineering departments with Siemens Energy before rejoining his former colleagues in Erie at Aalborg, which had become CMI Energy. He has held leadership roles in the U.S. and abroad with CMI and Thermal Engineering International. In 2013, he joined Bloom Engineering, leading a number of initiatives to grow and improve the company. In 2024, he guided Bloom Engineering through an acquisition by Wabtec Corporation, and he continues to work to expand the company.

In 2013, Boyce received Penn State's Alumni Achievement Award, which recognizes alumni 35 years of age and younger for their extraordinary professional accomplishments.



PennState
Behrend

RICHARD J. FASENMYER ENGINEERING DESIGN CONFERENCE

SENIOR PROJECTS

Computer Science and Software Engineering

8:00 a.m. | 206 Burke

Virtual Reality Applications in Materials Science

Penn State Behrend, sponsor
Aaron Erhart, Justin Williams, Logan Mullen, Peter Mica
Dr. Pulin Agrawal, faculty adviser

8:30 a.m. | 202 Burke

M-Type Asteroid Sampling Simulator

NASA Psyche Mission—Arizona State University, sponsor
James Harley, Allison Flatt, Jared Smithbauer, Mathias Nebiyou
Dr. Shahid Hussain, faculty adviser

8:30 a.m. | 206 Burke

Sponsored Research Proposal and Award Tracking System

Penn State Behrend, sponsor
Benjamin Tilzey, Tanvi Pabbati, Connor Campbell, Nhat Tran
Melanie Ford, faculty adviser

9:00 a.m. | 206 Burke

Easel for Canvas

Penn State Behrend, sponsor
Ian Burd, Georges Piatchou, Alexander Harris, Christina Garrett
Dr. Ziyun Huang, faculty adviser

9:00 a.m. | 202 Burke

Virtual Reality Space Game

NASA Psyche Mission, Arizona State University, sponsor
Joseph Elgin, John Pham, Angelina Valentin, Anu Mallya
Dr. Meng Su, faculty adviser

9:30 a.m. | 202 Burke

Computer Software for Skeletal Age Estimation

Mercyhurst University, sponsor
Matthew Hardenburg, Nicholas Novak, Cassidy Marquis,
Matthew Szarmach
Dr. Ziyun Huang, faculty adviser

9:30 a.m. | 206 Burke

Scavenger Hunt App for Behrend

Penn State Behrend, sponsor
Roland Grande, Jonathan Sedlak, Nathan Bergman, Devon Ott
Teck Meng Liaw, faculty adviser

10:00 a.m. | 001 Burke

AWS Data Perimeter

Erie Insurance Group, sponsor
Miles Hoffman, Brayden Boyer, Hrishikesh Rajaputra,
Derek Tran
Russell Martin, faculty adviser

10:00 a.m. | 202 Burke

Financial Wellness Education

Big Ideas Learning, A Larson Texts Company, sponsor
Katy Richardson, Vitesh Sharma, Samantha Groner, Carl Zhang
Dr. Wen-Li Wang, faculty adviser

10:30 a.m. | 001 Burke

AI-Based “Conscious” Virtual Human in Games

PARI Lab at Penn State Behrend, sponsor
Chase Anderson, William Freeburn, Austin Turner,
Tanner Lichty
Russell Martin, faculty adviser

10:30 a.m. | 202 Burke

Human Bone Identification Phone App

HD Forensics, sponsor
Nicholas Hunnell, Benjamin Harmon, Hayden Fisher,
Ghali Ouaritini
Dr. Jie Zhao, faculty adviser

11:00 a.m. | 001 Burke

K-12 Inventory System

Penn State Behrend, sponsor
Cory Ross, Joseph Letko, Maxim Melnik, Zahra Alkhalaf
Russell Martin, faculty adviser

8:00 a.m. | 204 Burke**Age-Invariant Face Recognition System**

Penn State Behrend, sponsor
 Nathaniel Beisel, Christopher Cheetham, Alfonso Palerm
 Dr. Azeemuddin Syed, faculty adviser

8:00 a.m. | 203 Burke**Autonomous Grass Mower**

Penn State Behrend, sponsor
 Emma Cavalline, Jacob Haines, Adam Straw
 Dr. Hussin Ketout, faculty adviser

8:30 a.m. | 205 Burke**ATX Power Supply Testing**

Engineers from Microsoft, sponsor
 Patrick Clark, Luke Sorg, Connor Swab
 Dr. Timothy Kurzweg, faculty adviser

9:00 a.m. | 203 Burke**Evaluation and Prototyping of HMI Controllers**

Matthews International, sponsor
 Daniel Edinger, Nicholas Groll, Yuchen Liu
 David Loker, faculty adviser

9:30 a.m. | 204 Burke**Embedded System Controlled OXCO**

Kyocera AVX Components Corporation, sponsor
 Daniel Gayoso, Trinity Ives, Andrew Reiland
 Dr. Hussin Ketout, faculty adviser

9:30 a.m. | 203 Burke**Smart Wireless Charger for Cellular Phones**

Penn State Behrend, sponsor
 Jahmai Edwards, Eliya Melnik, Vitaliy Momot
 Dr. Sudarshan Nelatury, faculty adviser

10:00 a.m. | 102 Burke**Radio Frequency Bio Sensor**

Penn State Behrend, sponsor
 Joseph Houck, Dylan Mattocks, Maya Volpe
 Dr. Ahmed Elnakib, faculty adviser

10:00 a.m. | 203 Burke**Smart Battery Charger for Vehicle's Starting Battery**

Penn State Behrend, sponsor
 Jane Partin, Carl Murzynski, Jason Bollinger
 Dr. Sudarshan Nelatury, faculty adviser

10:30 a.m. | 203 Burke**Autonomous Snow Blower 2024 Edition**

Penn State Behrend, sponsor
 Lucas Peterson, Owen Peterson, Samuel Rosario
 Dr. Azeemuddin Syed, faculty adviser

10:30 a.m. | 102 Burke**Telemetry System with Driver HUD**

Penn State Behrend SAE Club, sponsor
 John Abraham, Mason Gulu, Yiming Guo
 Dr. Ahmed Elnakib, faculty adviser

11:00 a.m. | 102 Burke**Classifying Invasive Species Using Drone Images and DL**

IoT Research Lab at Behrend—Dr. Abdallah Abdallah,
 Dr. Chris Shelton, sponsor
 Joseph George, Ryan Grabowski, Landon Grafton,
 Ezequiel Moreno
 Dr. Ahmed Elnakib, faculty adviser

11:00 a.m. | 203 Burke**Engine Dynamometer for SAE Club Honda GX35 Powertrain**

Penn State Behrend SAE Club, sponsor
 Sean Duckett, John Fennel, Joseph Mancino
 Dr. Azeemuddin Syed, faculty adviser

8:00 a.m. | 205 Burke**Data Sonification Weather Chimes**

Penn State Behrend, sponsor
 Rahaf Alsaedi, Cassia Robert
 David Loker, faculty adviser

8:30 a.m. | 204 Burke**Acoustical Data Collection System**

Penn State Behrend, sponsor
 Timothy Latham, Tyler Murdick
 Dr. Zhengran He, faculty adviser

8:30 a.m. | 203 Burke**The Development of a Tremorometer**

Eric Corty, sponsor
 Fatimah Aldossary, Sarah Alsunayyin, Rothana Martaa
 David Loker, faculty adviser

9:00 a.m. | 204 Burke**PDA Standard Batching Control System**

Process and Data Automation, sponsor
 Alex Renshaw, Garrett Sedoris, Alexander Vaughan
 Dr. Zhengran He, faculty adviser

Industrial Engineering

9:00 a.m. | 104 Burke

Ceramic Roller Manufacturing Optimization

SKF Aerospace, sponsor
Benjamin Tandlmayer, Catie Wuerstle, Seth Yanosko
Dr. Paul Lynch, faculty adviser

10:00 a.m. | 104 Burke

Developing Models to Forecast Seasonal Demand

LZRD Tech, sponsor
Caleb Dailey, Rachel Gau, John Sharp
Dr. Omar Ashour, faculty adviser

Interdisciplinary Business with Engineering Studies

8:30 a.m. | 001 Burke

Vibe Check AI

Vibe Check AI, sponsor
Anna Smith, Adrian Vance, Jordan DePrator
Carol Putman and Dr. Jeff Vaitekunas, faculty adviser

9:30 a.m. | 001 Burke

AI Camera System

Erie Insurance Group, sponsor
Emily Campbell, Zachery Egan, Stephanie Helman, Sable Vidas
Carol Putman and Dr. Jeff Vaitekunas, faculty adviser

9:00 a.m. | 001 Burke

Unmanned Logistics Delivery

Penn State Applied Research Lab, sponsor
Weston Eppley, Skylar Merry, Riley Novotny, Jason Waite
Carol Putman and Dr. Jeff Vaitekunas, faculty adviser

Interdisciplinary Science and Business

8:00 a.m. | 001 Burke

Yahn Planetarium Strategic Analysis

Greg Yahn, sponsor
Alaina Devlin, Maria DiToppa, Jenna Fischli, Joshua Kuplen,
Max Rohl
Dr. Yohannes Haile, faculty adviser

Note: The Fasenmyer Engineering Design Conference is pleased to offer students in Penn State Behrend's Interdisciplinary Science and Business major the opportunity to present their senior capstone project.

Mechanical Engineering

8:30 a.m. | 103 Burke

Chamber Shaker Table

PSN Labs, sponsor
Dylan Bellomy, Alex Lindquist, Reese Novosel, Bryce Walker
Dr. Baiou Shi, faculty adviser

8:30 a.m. | 105 Burke

High-Flow Drain Grate

Zurn, sponsor
Braden Fabritius, Colton Heasley, Jonathon Laier
Dr. Barukyah Shaparenko, faculty adviser

8:30 a.m. | 102 Burke

Continuous Fiber Printer

Aseman LLC, sponsor
Matthew Henn, Lucas Makai, Ian McGill, Jonathan Phillips
Dr. Xiawa Wu, faculty adviser

8:30 a.m. | 104 Burke

X-Ray Diffraction Masking Automation

SKF Aerospace, sponsor
Michael Ciocco, Robin Marihugh, Gavin Shawfield,
Nicholas Watkins
Dean Lewis, faculty adviser

8:30 a.m. | 107 Burke

Z-Mill Health Monitoring

ATI Inc., sponsor
Matthew Bernardi, Carter Clement, Matthew Kowalsky,
Mike Pazuchanics
Dr. Adam Hollinger, faculty adviser

9:00 a.m. | 105 Burke

Adjustable Height Flange

Zurn, sponsor
Alexander Legnine, Collin Petry, Tyler Pugh, Anthony Reto
Dr. Jun Zhou, faculty adviser

9:00 a.m. | 205 Burke

Cast Steel Sword

Penn State Behrend Materials & Manufacturing, sponsor
Nicole Croushore, Jacob Gajewski, Brody Mangel, Ellen Shade
Dr. Chetan Nikhare, faculty adviser

9:00 a.m. | 107 Burke

Double-Shear Fastener Strength Fixture

Parker Lord, sponsor
Caleb Beard, Stephen Brooks, Bennett Kerr, Thomas Reichle
Dr. Adam Hollinger, faculty adviser

9:00 a.m. | 103 Burke

Feeder Alignment Method

Eriez, sponsor
MacKenzie Crable, Victoria Mott, Rebecca Neiser,
Braedon Vehovic
Dr. Baiou Shi, faculty adviser

9:00 a.m. | 102 Burke

Printer Filtration System

Aseman LLC, sponsor
Susan Copus, Anna Havrilesko, Jocelyn Manson
Dr. Xiawa Wu, faculty adviser

9:30 a.m. | 205 Burke

Automated Forging Cell

Channelock Inc., sponsor
Coy Bardwell, Nathan Lee, Jacob Sack, Jonathan Vioral
Dr. Chetan Nikhare, faculty adviser

9:30 a.m. | 104 Burke

Bearing Wash System

SKF Aerospace, sponsor
Megan Krulisky, Jake Sciorilli, Thomas Succop, Jacob Zuber
Dr. Baiou Shi, faculty adviser

9:30 a.m. | 102 Burke

Engine Intake Optimization

Penn State Behrend SAE Club, sponsor
Benjamin DiMatteo, Nicholas Fisher, Adam Sacherich,
Gurinder Singh
Dr. Peter Ingram, faculty adviser

9:30 a.m. | 103 Burke

Heavy Magnet Stands

Eriez, sponsor
Andrew Burda, Andrew Prouty, Sean Schneider, Steven Sinka
Brian Lani, faculty adviser

10:00 a.m. | 103 Burke

Portable Gauss Fixture

Eriez, sponsor
Nicholas Formato, David Hilty, Michael Koleck, Nicholas Wilson
Dr. Jun Zhou, faculty adviser

10:30 a.m. | 107 Burke

Inline Closure De-Foiling

Berry Global, sponsor
Dennis Hakanen, Elijah Hunt, Evan Meister, Jonathan Simpkins
Dr. Hamid Sanei, faculty adviser

11:00 a.m. | 107 Burke

Subaru Engine Swapped Lotus

Tronix3D, sponsor
Jacob Krantz, Wyatt McGeary, Michael Schumacher,
Jonathan Vilsack
Dr. Hamid Sanei, faculty adviser

Mechanical Engineering Technology

9:30 a.m. | 105 Burke

Adjustable Non-Freeze Wall Hydrant

Zurn, sponsor
Elliott Weigand, Samuel Kaul
Dr. Steven Nozaki, faculty adviser

9:30 a.m. | 107 Burke

Automated Flash Removal of Bonded Rubber Mounts

Parker Lord, sponsor
Jocelyn McNany, Olivia Hodapp, Marshall George
Dr. Feng Qian, faculty adviser

10:00 a.m. | 107 Burke

Pellet Wheel Re-Design

Berry Global, sponsor
Haden Peters, Blaise Miller, Vincent Oddo
Adam Wielobob, faculty adviser

10:00 a.m. | 105 Burke

Sphere Brake Piston Retraction Improvement

Sphere Brake Defense Inc., sponsor
Oak Gaertner, Tanner Pasinski, Evan Prinkey
Dr. Nancy Study, faculty adviser

10:30 a.m. | 103 Burke

Trunnion Magnet Barrel Design

Eriez, sponsor
Eric Obringer, Caleb Kemp
Dr. Ihab Ragai, faculty adviser

Plastics Engineering Technology

8:00 a.m. | 104 Burke

Bio-Plastics: An Exploration of Sustainable Alternatives

SKF USA, sponsor
Marley Persch, Colin Deeter, Madison Messmer
Dr. Xiaoshi Zhang, faculty adviser

8:30 a.m. | 106 Burke

Investigation of LED Wavelength Effect on Optical Components Molded From Polycarbonate Resins

Clariance Technologies, sponsor
Jonathan Marks, Noah Morningstar, Daniel McMaster
Dr. Gamini Mendis, faculty adviser

9:00 a.m. | 106 Burke

Investigation of Fog Light Material Optimization for Thermal and Optical Management

Clariance Technologies, sponsor
Ryan Bell, Riley Donahue
Dr. Gamini Mendis, faculty adviser

9:30 a.m. | 106 Burke

Shrinkage Prediction of HDPE Through Material Characterization

Rehrig Pacific Company, sponsor
Riley Bak, Sydney Svetkovich
Brian Young, faculty adviser

10:00 a.m. | 106 Burke

Plastic Sheet Forming Over Expanded Polypropylene

JSP, sponsor
Marina Eshbaugh, Kanav Garg, Isabel Mannella
Nicholas Vitelli, faculty adviser

2025 CAPSTONE PROJECT SPONSORS

Thank you to all our sponsors for their help with this year's engineering senior design capstone projects! If your company is interested in sponsoring a senior design project, or if you would like more information about industry partnerships, please visit behrend.psu.edu/capstone.

- Aseman LLC
- ATI Inc.
- Berry Global
- Big Ideas Learning, A Larson Texts Company
- Channellock Inc.
- Clarience Technologies
- Eric Corty
- Engineers from Microsoft
- Erie Insurance Group
- Eriez
- HD Forensics
- IoT Research Lab at Behrend—
Dr. Abdallah Abdallah,
Dr. Chris Shelton
- JSP
- Kyocera AVX Components Corporation
- LZRD Tech
- Matthews International
- Mercyhurst University
- NASA Psyche Mission—Arizona State University
- PARI Lab at Penn State Behrend
- Parker Lord
- Penn State Applied Research Lab
- Penn State Behrend
- Penn State Behrend Materials & Manufacturing
- Penn State Behrend SAE Club
- Process and Data Automation
- PSN Labs
- Rehrig Pacific Company
- SKF Aerospace
- SKF USA
- Sphere Brake Defense Inc.
- Tronix3D
- Vibe Check AI
- Greg Yahn
- Zurn

ERIEZ

Outstanding Capstone Project Sponsor:

Since its founding in Erie in 1942, Eriez has emerged as a global leader in separation technologies, providing customer-centric solutions to the mining, food, recycling, packaging, aggregate, and other processing industries. Eriez continues to be headquartered in Erie, with 1,000-plus employees worldwide designing, manufacturing, and marketing the company's equipment and services on six continents through 13 international subsidiaries and an extensive sales network.

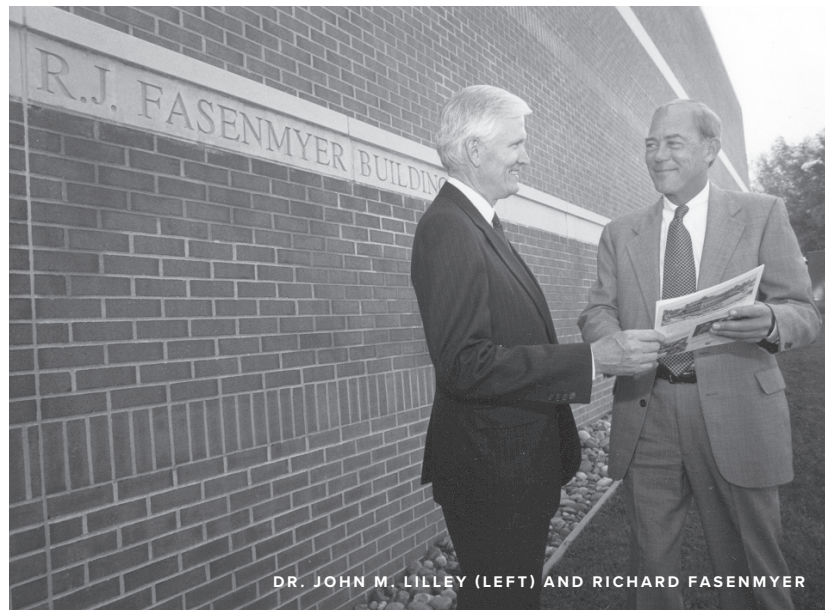
A BRIEF HISTORY OF THE RICHARD J. FASENMYER ENGINEERING DESIGN CONFERENCE

The Richard J. Fasenmyer Conference showcases the results of yearlong engineering senior capstone projects supervised and managed by students and guided by their faculty and industry advisers. In many cases, the projects address applied problems posed by industrial sponsors.

The first public presentation of senior design projects at Behrend took place on April 22, 1995, in Hammermill and Fasenmyer buildings on the west end of campus. Seventy-nine students participated, presenting thirty-one projects.

Since then, the annual presentation has grown: To date, nearly 6,000 students have presented more than 1,500 projects. Today, more than 200 students are presenting.

In 2005, the conference was named to honor the legacy of Richard J. Fasenmyer '69, a longtime supporter of Penn State Behrend's School of Engineering. An Alumni Fellow and Distinguished Alumnus of the University, Dick Fasenmyer was the first Penn State Behrend graduate to donate \$1 million to the college.



DR. JOHN M. LILLEY (LEFT) AND RICHARD FASENMYER

SPONSOR A SENIOR DESIGN PROJECT!



Looking to solve a problem at your company? We can help! Through our senior design projects, our students can help your company find creative solutions and fresh ideas. As a project sponsor, you'll not only gain access to the world-class resources of Penn State—you'll also interact with bright and creative young engineers (who might just be your future employees!).

Choose from focus areas:

- Electrical/computer
- Industrial
- Mechanical
- Plastics
- Software/computer science

Questions? Ideas?

Contact Dean Lewis, senior project coordinator, at BDSeniorDesign@psu.edu.

The deadline for 2025-26 project sponsorships is August 15.



ALUMNI: PARTNER WITH PENN STATE BEHREND!

Here are six ways for you to engage with Penn State Behrend engineering students:

1 RECRUIT

Hire Behrend engineering students and alumni—it helps them launch their careers, and it helps you grow your business.

4 COLLABORATE

Work with Behrend students and faculty on product prototyping and problem-solving.

2 ENGAGE

Share your expertise with students and faculty through lectures, visits, advisory board roles, and more.

5 GIVE

Donate to scholarships and programs—your generous support makes a difference for our students.

3 ADVOCATE

Tell your network about your success stories in working with Behrend, advancing our mission.

6 INVEST

Work with Behrend to invest in your organization—through workforce development, research, and more.

LEARN MORE: Visit behrend.psu.edu/partner, call 814-898-6164, or email recruitbehrend@psu.edu.

This publication is available in alternative media on request.

The University is committed to equal access to programs, facilities, admission and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University's educational mission, and will not be tolerated. Direct all inquiries regarding the nondiscrimination policy to the Office of Equal Opportunity and Access, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-5901, oeoa@psu.edu, 814-863-0471. UBR EBO 25-155