

RICHARD J. FASENMYER

ENGINEERING DESIGN CONFERENCE

SATURDAY, APRIL 29, 2023



ADVANCED FINISHING USA
OUTSTANDING CAPSTONE
PROJECT SPONSOR



SCHEDULE OF EVENTS

7:30 a.m.

Registration
Second Floor, Burke Center

8:00-11:30 a.m.

Senior Presentations
Half-hour sessions including Q&A

11:45 a.m.-12:15 p.m.

Keynote Speaker Matt MacBeth
Samuel P. "Pat" Black III Conference Center
180 Burke

12:15-12:30 p.m.

Student and Sponsor Award Presentations
Samuel P. "Pat" Black III Conference Center
180 Burke

Class Pictures Immediately Following Awards

Photos will be taken in 180 Burke.
Assemble in the hallway outside of 180
Burke and wait to be called. Photos will
be taken in this order: ME, ECET, CSSE,
ECE, MET, IE, PLET, IBE

Reception

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

KEYNOTE SPEAKER



Matt MacBeth '96

Founder, the Billion Dollar BHAG Movement

Matt MacBeth graduated from Penn State Behrend in 1996 with a degree in Electrical Engineering. He has taken an entrepreneurial approach to his career, founding several tech startups, leading technological innovations, and creating new business models. He also has written a series of entrepreneurship and business workbooks to help others do the same.

MacBeth's current focus is the Billion Dollar BHAG Movement, leading a network of like-minded entrepreneurs who are pooling resources and sharing in abundance with the Big, Hairy, Audacious Goal of putting a billion dollars into the hands of front-line businesses, nonprofit organizations, and churches by the end of 2023.

MacBeth is a familiar face at Penn State Behrend—he is an Executive in Residence with the Black School of Business, a member of the Interdisciplinary Business with Engineering Studies Advisory Board, and a sponsor of senior capstone projects.



PennState
Behrend

RICHARD J. FASENMYER ENGINEERING DESIGN CONFERENCE

SENIOR PROJECTS

Computer Science and Software Engineering

8:00 a.m. | 102 Burke

Penn State Behrend Tutoring Site

Larson Texts Inc., sponsor
Eric Duma, Quincy Nguyen, Brandon Morris, Jacob Wagner
Teck Meng Liaw, faculty adviser

8:00 a.m. | 105 Burke

Quality Assessor

Penn State Behrend, sponsor
Kenneth Burt, Brandon Pijanowski, Alex Anderson
Dr. Chen Cao, faculty adviser

8:30 a.m. | 002 Burke

DevOps CI/CD Pipeline

Erie Insurance, sponsor
Abdulla Iznurov, Mateen Shaik, Luke Sloan, Yuba Neupane
Dr. Shahid Hussain, faculty adviser

8:30 a.m. | 102 Burke

Ecological Momentary Assessment

Penn State Behrend, sponsor
Siddharth Pandya, Ryan Pape, Garrett Wimer
Teck Meng Liaw, faculty adviser

8:30 a.m. | 105 Burke

Porting Application Software for a Linux Environment

Clarience Technologies, sponsor
William Hoce, Christopher Mamatas, Saif Alkaabi, Daniel Stiller
Dr. Ahmed Sammoud, faculty adviser

9:00 a.m. | 205 Burke

2D Motion Analysis/Training Lab Software System

Penn State Behrend, sponsor
Sherman Brizzi, Bryonna Crowley, Alexander Bosco,
Colin Barry
Melanie Ford, faculty adviser

9:00 a.m. | 102 Burke

Map Room Interactive Mural

Lee Shadeck, sponsor
Kevin Chen, Nathan Madey, Jake Coughenour, Hunter Stultz
Thomas Rossi, faculty adviser

9:00 a.m. | 104 Burke

Redesign of Courseware for Observational Research

Penn State Behrend, sponsor
Emily Green, John Cageao, James Ayres
Dr. Ziyun Huang, faculty adviser

9:00 a.m. | 103 Burke

Web-Based Game for Psyche

NASA Psyche Mission, sponsor
Bernhard Pangels, Sebastian George, Marcus James,
Rowan Fisher
Dr. Meng Su, faculty adviser

9:30 a.m. | 102 Burke

Academic Success Performance App

Penn State Ross and Carol Nese College of Nursing, sponsor
Ghana Chuwan, Grant Barnhart, Yaoqi Dong, Akshat Shah
Thomas Rossi, faculty adviser

9:30 a.m. | 103 Burke

AR/WebXR for Public Engagement

NASA Psyche Mission, sponsor
Brandon Lupole, Adam Wojtaszczyk, Jiayuan Wen, Vasu Patel
Dr. Chen Cao, faculty adviser

9:30 a.m. | 105 Burke

Business Week RONA Simulator

ACES Inc., sponsor
Karnav Desai, Abdulla Mohammed Alnuaimi, Jesse Graubard,
Gregory Pocij
Dr. Shahid Hussain, faculty adviser

9:30 a.m. | 104 Burke

Litter Games

Erie Litter Critters, sponsor
John Lapiana, Dalton Burton, Tommy Fornear, Kenton Porter
Dr. Ziyun Huang, faculty adviser

10:00 a.m. | 105 Burke

SS Contest Manager and Testbed

KS Drone, sponsor
Nolan Stevenson, Seth Stevenson, Dylan Arnold,
Kevin Muirhead
Russell Martin, faculty adviser

Electrical and Computer Engineering

8:00 a.m. | 205 Burke

Smart Wireless Control Unit for EV Chargers

Rick Weaver Buick GMC, sponsor
Jordan Wojtczak, Michael McMahon, Benjamin Marsteller,
Nicholas Hepler
Dr. Mohammad Rasouli, faculty adviser

8:30 a.m. | 205 Burke

Automated Energy Monitoring

Rick Weaver Buick GMC, sponsor
Dylan Barber, Alec Moran, Alex Killinger, Donald Watters
Dr. Mohammad Rasouli, faculty adviser

8:30 a.m. | 203 Burke

Development of a Mobile App for Pest Identification

Penn State Behrend, sponsor
Kailey Smotek, Andre Tench, Adam Robertson
Dr. Abdallah Abdallah, faculty adviser

9:00 a.m. | 203 Burke

Agriculture Internet of Things (AIoT) Monitoring System

Penn State Behrend, sponsor
Hunter DiPadova, Jared Patula, Gabriel Nova Bejarano
Dr. Myung Cho, faculty adviser

9:30 a.m. | 205 Burke

Data Fusion Real-Time Tracking System

Northrop Grumman Corporation, sponsor
Simon Brown, Max Piazza, Christopher Ramos
Dr. Abdallah Abdallah, faculty adviser

9:30 a.m. | 203 Burke

Modern Technology Meets Old School

Vintage Modified, sponsor
Emily Deal, Nicholas Panochko, Susan Kandor, Tristan Galdys
Dr. Myung Cho, faculty adviser

10:00 a.m. | 203 Burke

IoT Household Robots: Autonomous Lawnmower

IoT Research Lab at Behrend, Dr. Abdallah Abdallah, sponsor
Jacob Fankhouser, Ethan Johnston, Jason Widjaja
Dr. Kyeiwaa Asare-Yeboah, faculty adviser

10:00 a.m. | 205 Burke

Wireless Power Transfer

Penn State Behrend Electrical and Computer Engineering
Department, sponsor
Devonte Cherry-Lish, Jonathon Cron, Haotian Guan
Dr. Sudarshan Nelatury, faculty adviser

10:30 a.m. | 205 Burke

Developing a Drone-Based Radar System

Penn State Behrend, sponsor
Micah Kautchick, Landon Badac, Caleb Torres
Dr. Myung Cho, faculty adviser

10:30 a.m. | 203 Burke

Robotic Soccer Goalie

Penn State Behrend Athletics, sponsor
Jacob Metts, Ethan Yant, Gavin Ferrell, Wen Soong
Dr. Kyeiwaa Asare-Yeboah, faculty adviser

Electrical and Computer Engineering Technology

10:00 a.m. | 207 Burke

Voice and Tone Alarm

Komatsu Mining, sponsor
Keven Rall, Hagan Cook, Benjamin Rodgers
Dr. Hussein Abdeltawab, faculty adviser

10:30 a.m. | 207 Burke

High Temperature Plastics 3D Printer System

Penn State Behrend, sponsor
Anthony Panucci, Matthew Rockage, Zachary Thomas
David Loker, faculty adviser

Interdisciplinary Business with Engineering Studies

8:00 a.m. | 001 Burke

Semi-Submersible Tactical Logistics System

ARL, sponsor
Summer Hannah, Nicholas Post, Sean Strain
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

8:30 a.m. | 001 Burke

Remote Monitoring Industry 4.0

ARL, sponsor
Kolden Cook, Justin LeDonne, Gabe MacWilliams
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

Interdisciplinary Business with Engineering Studies (continued)

9:00 a.m. | 001 Burke

Dynamic Bar Codes

ARL, sponsor
Justin Hockenberger, Joshua Lewis, Zack Ulrich
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

9:30 a.m. | 001 Burke

Digital Communication

Erie Insurance, sponsor
James Lynch, Izabella Otteni, Ana Stinchcomb
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

10:00 a.m. | 001 Burke

Billion Dollar BHAG

Matt MacBeth, sponsor
Erica Jewell, Colin Kelly, Seth Myers
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

10:30 a.m. | 001 Burke

Supply Chain and Inventory Optimization

Advanced Finishing USA, sponsor
Kyle Laughner, Shannon Miller, Corey Spencer
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

11:00 a.m. | 001 Burke

Local Market Expansion

Edinboro Market, sponsor
Connor Brown, Nathan Lutz, Danielle Turner
Dr. Jeff Vaitekunas and Carol Putman, faculty advisers

Industrial Engineering

8:00 a.m. | 207 Burke

Sand Molding Process Improvement

Electric Materials, sponsor
Bruno Castagneto, Cory Fleming, Hannah Rishak,
Theodore Sutrisno
Dr. Paul C. Lynch, faculty adviser

8:30 a.m. | 207 Burke

Adaptive Playground/Play Space ADA Approved

Elizabeth Lee Black School at the Barber National
Institute, sponsor
Michael Cammarata, Emmanuella Iwere, Alexander Lisichenko,
Brian Schneider
Dr. Hsin-Li Chan, faculty adviser

9:00 a.m. | 207 Burke

AGV/AMR Simulation for Hot Test at Cummins JEP

Matthew Ryan, Cummins JEP, sponsor
Michael Clamp, Skylar Hutchins, Aiden Morrow
Dr. Yohannes Haile, faculty adviser

9:30 a.m. | 207 Burke

Behrend Admissions Event Flow and Function

Penn State Behrend Admissions, sponsor
Yogesh Bhambhwani, Brennan Cardillo, Savanna Carr,
Dongil Gweon
Dr. Yuan-Han Huang, faculty adviser

Mechanical Engineering

8:00 a.m. | 206 Burke

Biology in Action: Escape the Matrix

Penn State Behrend Biology Department, sponsor
Andie Arblaster, Charles Goodman, Brenna Leavitt,
Brayden Reed
Dr. Xiawa Wu, faculty adviser

8:00 a.m. | 203 Burke

Combustor Air-Fuel Delivery System

Wabtec, sponsor
Mackenzie Bickling, Luke Dillen, Dylan Mroz, Shane Sciorilli
Dr. Jun Zhou, faculty adviser

8:00 a.m. | 202 Burke

Improve Manufacturing of the 16" HVF Spring Assembly

Eriez Manufacturing, sponsor
Julien Bergeron, Austin McColpin, Joshua Turton
Dr. Hamid Sanei, faculty adviser

8:30 a.m. | 206 Burke

Adjustable Damper Design

Parker LORD, sponsor
Justin Brown, Ryan Kenney, David Konkol, Olivia Wienczkowski
Dr. David Beevers, faculty adviser

8:30 a.m. | 204 Burke

Designing a Continuous Fiber 3D Printer

ASEMAN LLC, sponsor
Mason Bender, Keagan Howard, Quinton Kookan, Garrett Orr
Dr. Adam Hollinger, faculty adviser

8:30 a.m. | 202 Burke

Vibratory Feeder Tray Design for Higher Capacity

Eriez Manufacturing, sponsor
Thomas Anderson, Alex Edder, Maxwell Limrick, Ryan Sisitki
Dr. Yi Wu, faculty adviser

9:00 a.m. | 204 Burke

Split Line Bandsaw

U.S. Bronze Foundry and Machine Inc., sponsor
Jonathan Fiscus, Tayler Schwabenbauer, Ashley Settineri,
Derek Steele
Dr. Baiou Shi, faculty adviser

9:30 a.m. | 204 Burke

Cast Steel Process and Property Optimization

Penn State Behrend, sponsor
Benjamin Fahrney, MollyAnne Lloyd, Chase Schultz,
James Zimmer
Brian Lani, faculty adviser

9:30 a.m. | 202 Burke

Sphere Brakes for Passenger Vehicles

Sphere Brake Defense LLC, sponsor
Sydney Brooks, Warren Ostrowski, Jacob Rose, Kyle Sayre
Dr. Mark Rubeo, faculty adviser

10:00 a.m. | 204 Burke

Development of a Prosthetic for a Missing Digit

Penn State Behrend, sponsor
Cole Davidson, Katherine Korn, Jacob Lawrence
Dr. Charlotte de Vries, faculty adviser

10:00 a.m. | 103 Burke

In-Situ Resource Utilization: Scalable Refining Process

NASA Psyche Mission, sponsor
Forest Kern, Hunter Mott, Nicholas Rahuba, Tyler Speraw
Dr. Baiou Shi, faculty adviser

10:00 a.m. | 202 Burke

Tennis Prosthesis

Neubert Family, sponsor
Maxwell Myers, Deven Phillips, Morgan Tarbrake,
Zachary Vandervort
Dr. Hamid Sanei, faculty adviser

10:30 a.m. | 106 Burke

Assembly of a Sound-Damped MRI Bearing

SKF USA, sponsor
Matthew Balint, Jerica Fischer, Matthew Guy, Alex Harpst
Dean Lewis, faculty adviser

10:30 a.m. | 105 Burke

Fuel Cell-Powered Freight Locomotive

Wabtec, sponsor
Olivia Eagley, Luke Fiely, Tyler Ortz
Dr. Adam Hollinger, faculty adviser

10:30 a.m. | 103 Burke

Future Power Solutions Exploring Hypothesized Surfaces

NASA Psyche Mission, sponsor
Ewin Chen, Alexander McAuley, Colin Skinner, Kyle Vanpelt
Peter Ingram, faculty adviser

10:30 a.m. | 204 Burke

Reduce Plastic Pellet Waste at Transfer Points

Plastek, sponsor
Cameron Guercio, Luqman Israd, Jacob Weckerly,
Christopher Weller
Dr. Barukyah Shaparenko, faculty adviser

11:00 a.m. | 204 Burke

Industrial Furnace Temperature Sensor

PSENERGY LLC, sponsor
Timothy Gardner, Tashawn Green, Mark Lalama,
Nathan Poydence
Dr. Jiawei Gong, faculty adviser

11:00 a.m. | 106 Burke

Precision Measurement of Bearing Friction

SKF USA, sponsor
Austin Buffone, David Lasch, Joeli Ritmiller, Mark Schmidt
Dr. Xiawa Wu, faculty adviser

Mechanical Engineering Technology

8:00 a.m. | 204 Burke

Die Lubrication and Fume Control

Howmet Aerospace, sponsor
Jacob Fancella, Jacob Fisher, Shaun Mikulan
Shannon Sweeney, faculty adviser

9:00 a.m. | 206 Burke

Damper Tubeform Retainment Design

Parker LORD, sponsor
Brian Egan, Donald Russell Jr.
Phil Jones, faculty adviser

9:00 a.m. | 202 Burke

Palletizer Lift Magnet Stripper Plate Redesign

Eriez Manufacturing, sponsor
Matthew Dunham, Daniel Retamal, Andrew Sobek, Wyatt Tollner
Dr. Feng Qian, faculty adviser

9:30 a.m. | 206 Burke

Racked Pole Puller

Northwestern Rural Electric Cooperative Inc., sponsor
Nola Hessom, Evan Lang, Dylan Seebacher
Dr. Qing Hao, faculty adviser

10:00 a.m. | 206 Burke

Vertical Lathe Guard

Ajax/CECO/EriePress, sponsor
Nicholas Barnes, Greg Schriener, Cameron Shaw, Zachary Tingley
Dr. Steven Nozaki, faculty adviser

10:30 a.m. | 206 Burke

Design of a Combined Loading Testing Apparatus

Penn State Behrend, sponsor
Cayla Meyer, John Rutkowski, Clayton Upcraft
Dr. Ihab Ragai, faculty adviser

Plastics Engineering Technology

8:00 a.m. | 107 Burke

Characterizing Waste Plastic for Use as an Aggregate

Penn State Behrend, sponsor
Evan States, Joseph Previte, Brianna Rathbun
Dr. Gamini Mendis, faculty adviser

8:00 a.m. | 106 Burke

Supermileage Tire Design

Penn State Behrend Supermileage, sponsor
Ryan Datz, Kelli Hoffer, Nick Mabie
Dr. Samy Madbouly, faculty adviser

8:30 a.m. | 107 Burke

Craft Alloy Core Pin Comparison and Study Continuation

Crafts Technology, sponsor
Luke Miller, Alexander McHale, Derrick Shields
Brian Young, faculty adviser

8:30 a.m. | 106 Burke

Supermileage Windshield Manufacture

Penn State Behrend, sponsor
Ian Porter, Wesley Good, Zach Edwards
Brad Johnson, faculty adviser

9:00 a.m. | 106 Burke

Characterizing the Impact of D3 on Pressure Prediction

Penn State Behrend, sponsor
Emelia Graham, Daniel Sterner, Sam Krantweiss
Brad Johnson, faculty adviser

9:00 a.m. | 107 Burke

Effects of Reprocessing on Properties of Flat Fiber PA

SPE IMD, sponsor
Matt Goldman, Logan Battles, Tristen Lee
Dr. Xiaoshi Zhang, faculty adviser

9:30 a.m. | 107 Burke

Comparative Rheology Study of Polymers

SPE IMD, sponsor
Sam York, Juston Jones
Brad Johnson, faculty adviser

9:30 a.m. | 106 Burke

Over-Molded Scissor Tong Design Development

Penn State Behrend, sponsor
Dylan Brown, Julia Fasiczka, Lucas Krolczyk
Jason Williams, faculty adviser

10:00 a.m. | 106 Burke

Food Packaging Slewing Bearing

SKF USA, sponsor
Nicholas Clouser, Hunter Fox, Taye Sayre
Dr. Xiaoshi Zhang, faculty adviser

10:00 a.m. | 107 Burke

Shear Degradation Study

SPE IMD, sponsor
David Petyk, Michael Le, Mason Stcyr
Jason Williams, faculty adviser

10:30 a.m. | 107 Burke

Strain Rate to Temperature Correlation

SPE IMD, sponsor
Cameron McNany, Nathaniel Bean
Jason Williams, faculty adviser

2023 CAPSTONE PROJECT SPONSORS

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

- ACES Inc.
- Advanced Finishing USA
- Ajax/CECO/EriePress
- ARL
- ASEMAN LLC
- Clarience Technologies
- Crafts Technology
- Cummins JEP/Matthew Ryan
- Edinboro Market
- Electric Materials
- Elizabeth Lee Black School at the Barber National Institute
- Erie Insurance
- Erie Litter Critters
- Eriez Manufacturing
- Howmet Aerospace
- IoT Research Lab at Behrend/ Dr. Abdallah Abdallah
- Komatsu Mining
- KS Drone
- Larson Texts Inc.
- Matt MacBeth
- NASA Psyche Mission
- Neubert Family
- Northrop Grumman Corporation
- Northwestern Rural Electric Cooperative Inc.
- Parker LORD
- Penn State Behrend
- Penn State Behrend Admissions
- Penn State Behrend Athletics
- Penn State Behrend Biology Department
- Penn State Behrend Electrical and Computer Engineering Department
- Penn State Behrend Supermileage
- Penn State Ross and Carol Nese College of Nursing
- Plastek
- PSENERGY LLC
- Rick Weaver Buick GMC
- Lee Shadeck
- Sitter Insurance
- SKF USA
- SPE IMD
- Sphere Brake Defense LLC
- U.S. Bronze Foundry and Machine Inc.
- Vintage Modified
- Wabtec

Outstanding Capstone Project Sponsor:

Advanced Finishing USA

Since its founding in 1970, Erie-based Advanced Finishing USA has been a leader in the powder coating industry. Today, under the guidance of a second generation of the Yahn family, Advanced Finishing offers elite wood grain powder coating, epoxy and polyester powder coating, wet paint finishing, and custom solutions for a range of industries, including military, mining, automotive, aerospace, electrical, and medical.



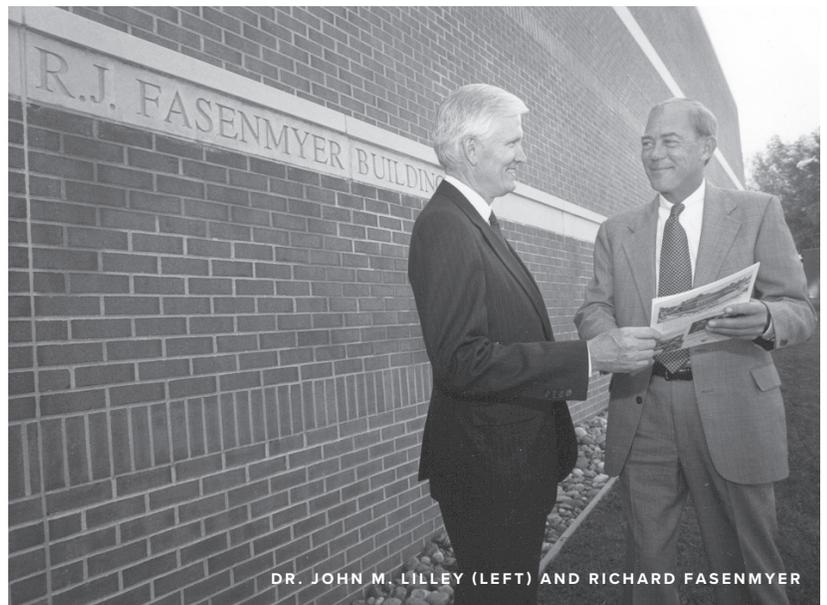
A BRIEF HISTORY OF THE RICHARD J. FASENMYER ENGINEERING DESIGN CONFERENCE

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 5,500 students have presented more than 1,320 projects. Today, more than 250 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!

It's not too soon to start thinking about next year's projects!



Looking for creative solutions to a challenge in your company? We can help! Our students will work on solutions for your back-burner projects.



- Help prepare Penn State Behrend engineering students for their careers.
- Meet potential employees for your company.
- Interact with bright, energetic, and creative young engineers.
- Gain access to the resources and libraries of Penn State, a world-class research university.

Focus areas:

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



Questions? Ideas?

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

Deadline for 2023-24 project sponsorships is August 15!



PennState
Behrend

School of Engineering

