THE
UNIVERSITY
OF RHODE ISLAND
COLLEGE OF
ENGINEERING

E-Week
2026

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CAPSTONE DESIGN SHOWCASE

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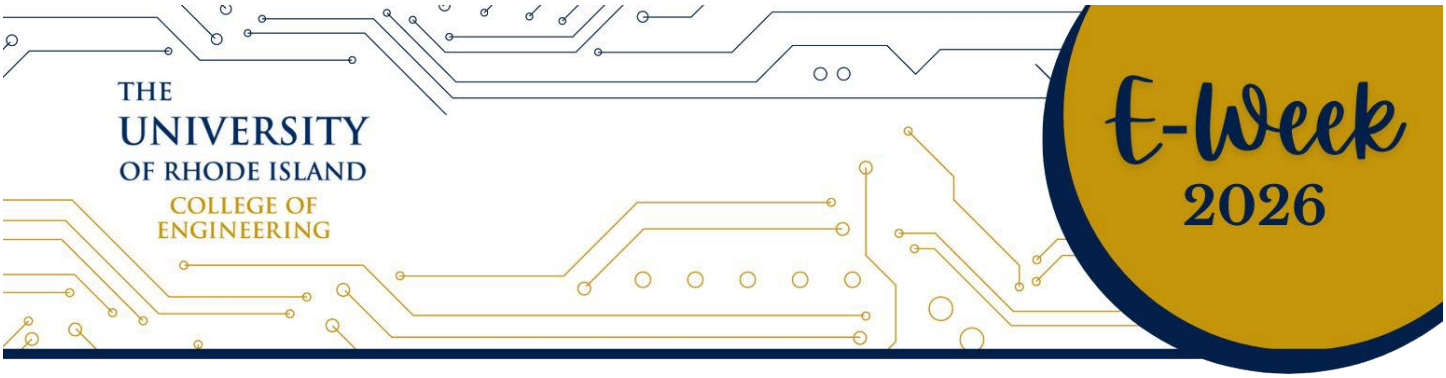


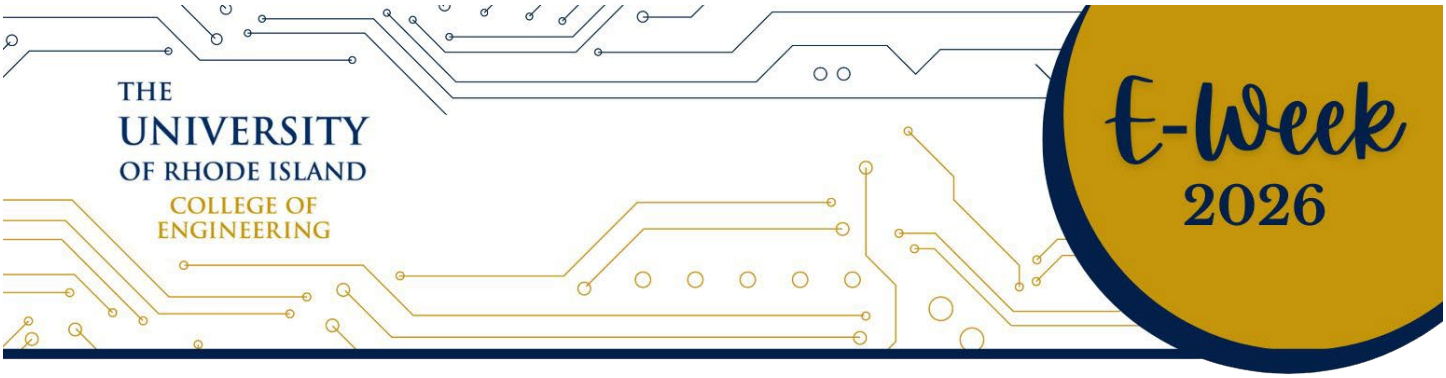
WELCOME TO THE 2026 ENGINEERING WEEK CAPSTONE DESIGN SHOWCASE

The Capstone Design experience is a cornerstone of our engineering curriculum, where students bridge classroom learning with real-world application. Today's showcase marks the culmination of that experience.

Over the past year, **325** students across **79** teams have tackled complex design challenges – many in collaboration with industry sponsors, community organizations, practicing engineers, and faculty mentors. Their projects reflect not only their technical skill and creativity, but also a deep commitment to solving real-world problems.

As you explore the projects on display, we invite you to engage with the students, ask questions, and share in their excitement. Today's showcase is a testament to their hard work and a preview of the bright future ahead of them.

Biomedical Engineering	Toray Commons	1:00-4:00 PM
Chemical Engineering	FCAE 120	1:00-4:00 PM
Civil Engineering	FCAE 120	1:00-4:00 PM
Computer Engineering	FCAE 150	1:00-4:00 PM
Electrical Engineering	FCAE 150	1:00-4:00 PM
Industrial and Systems Engineering	FCAE 180/180A	1:00-4:00 PM
Mechanical Engineering	FCAE 010/025/155	12:00-3:00 PM
Ocean Engineering	Toray Commons	1:00-4:00 PM



BIOMEDICAL ENGINEERING

PROF. KUNAL MANKODIYA

1:00-4:00 Project Presentations in Toray Commons

HaloSense – Wearable Opioid Overdose Detection
An ear-worn device integrating PPG and ECG sensors to detect signs of respiratory depression, triggering Bluetooth-enabled overdose alerts. It aims to support individuals at risk of opioid overdose with real-time physiological monitoring.

Students: Brady Joseph Ashness, Jared David Allen, Mitch Thomas Daniell, Shiva K Veera
Mentors: Dr. Anita Jacobson (Pharmacy), Vignesh Ravichandran (ELE/BME)

NexShot – Smart Pickleball Paddle
A paddle embedded with pressure sensors and IMUs to track swing motion, impact force, and performance metrics, with feedback through a mobile app. It aims to enhance athletic training and technique development for recreational and competitive pickleball players.

Students: Madden Buckley, Brooke Formanek, Tiffany McLoughlin, Kiley Stahl, Anna Thompson
Mentors: Matthew Galipeau (BME), Cameron Amaral (MechE)

BruitSense – Blood Flow Sound Monitoring
A wearable acoustic sensing system, paired with a phantom model, to capture and analyze bruits in AV fistulas for dialysis patients. It aims to assist clinicians in early detection of vascular access complications.

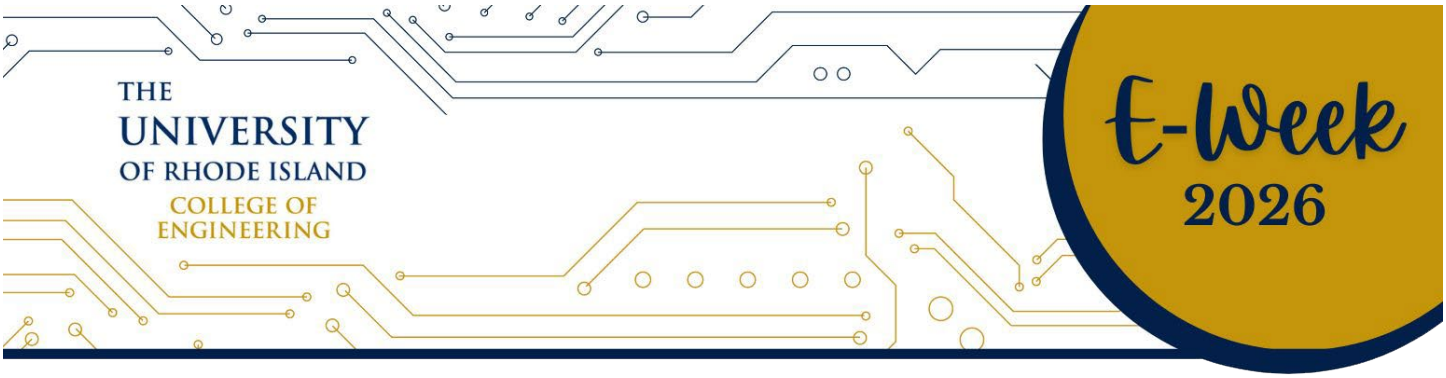
Students: Anna Erb, Jolaife Adenugba, Kytalin Hendrickson, Luci Schneider
Mentor: John Lansing (Cytiva)

ANALYTIQ – Smart Heat-Monitoring Vest
An e-textile vest combining ECG and temperature sensors to monitor physiological responses and detect early signs of heat stress and heat stroke. It is intended for athletes, outdoor workers, and military personnel in high-temperature environments.

Students: Abigail Zadorozny, Regan Reilly, Reyyan Akhtarini, Matthew Picchioni
Mentors: Nicole Jones (AnalytIQ), Dhaval Solanki (ELE)

Stroke ARise – AR-Based Rehabilitation for Stroke Survivors
A sensor-enabled rehabilitation glove paired with an Augmented Reality (AR) gaming environment (Jenga-style) to support stroke survivors in regaining hand mobility. It aims to promote engaging therapy through HoloLens-based hand tracking.

Students: Olivia Moretti, Colin Naughton, Brady McGloin, Andrew Fisher
Mentors: Dr. Susan D'Andrea (Kinesiology), Md Abdullah Al Rumon (BME/ELE)



EEG-2-Text: Brain-to-Text Communication System
A software-based system converting EEG brain signals into text using deep learning. The project aims to integrate an EEG encoder with a large language model (LLM) decoder, offering a non-invasive communication solution for individuals with speech and motor impairments.

Students: Grace Stamp, Erik Bird, Marissa Burger, Reese Murphy
Mentor: Dr. Rahul Singh (BME)

MEDEMA – Smart Pen for Pitting Edema Detection
A handheld device to objectively measure tissue indentation in pitting edema using a linear potentiometer and force sensors. The project builds on a previous year's prototype, improving hardware, calibration methods, and usability for future clinical feedback studies.

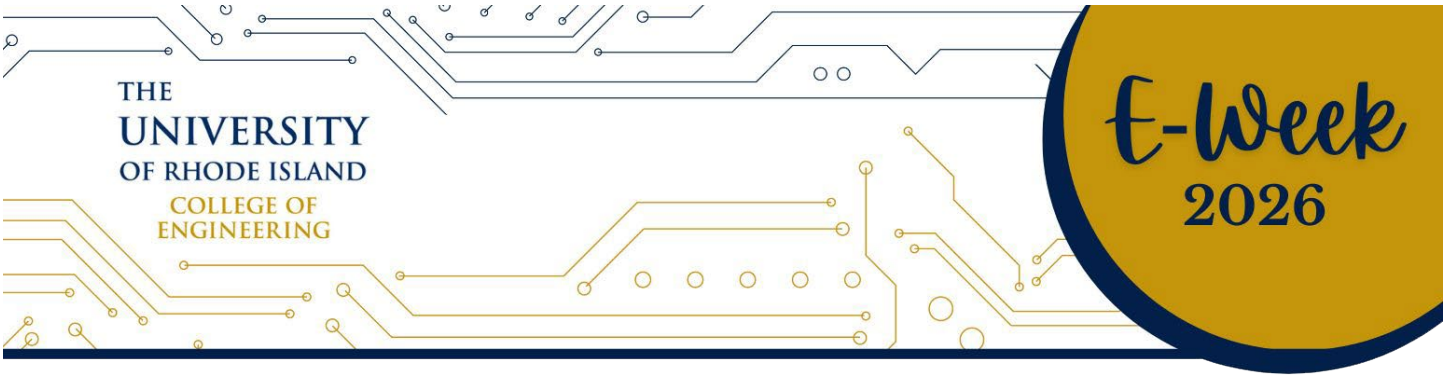
Students: Olivia Wojnilo, Vrishab Dhavale, Angel Berganza, Erik Lagace
Mentors: Dr. Nishtha Bhagat (BME/ELE), Khatuna Zannat Mim (BME/ELE)

ReFLEX – Rehabilitation through Functional Liquid-crystal Elastomer eXoskeleton
A wearable rehabilitation glove for stroke patients, integrating soft actuators made from conductive liquid-crystal elastomers (cLCEs) to assist hand extension. The project aims to provide affordable, at-home therapy by enabling active assistive movement with future feedback control integration.

Students: Liam Kennings, Liv Kittrell, Sam Toppa, Karissa Sullivan
Mentor: Dr. Ryan Poling-Skutvik (ChemE)

Asterixis: Hand Flapping Tremor Technology
A wearable sensor system designed to detect and quantify asterixis, a flapping tremor often observed in patients with hepatic or renal failure. The goal is to replace the current subjective clinical assessments with a standardized diagnostic tool.

Students: Abby Hollingworth, Amanda Fielder, Nicole Stone, Megan Angell
Mentor: Dr. Ryan Chapman (Kinesiology)



CHEMICAL ENGINEERING

DR. JESSICA ALESIO

1:00-4:00 Project Presentations in FCAE 120

Seniors in the Department of Chemical, Biomolecular, and Materials Engineering were tasked with modeling an existing chemical engineering design process of their choice. Students then determined a focus area for process improvement such as process safety, sustainability, or waste treatment.

Large Scale Production of mRNA Vaccines
Hayden Reilly
Mateo Munoz Gil
Jayden St. Louis

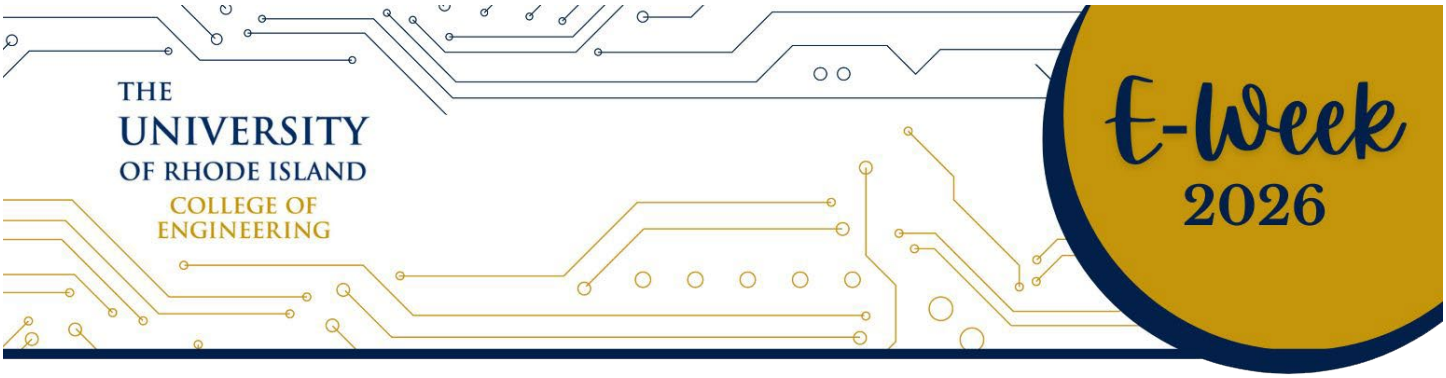
Recombinant Insulin Production via E. Coli Bacteria Cells
Jacob Bross
Los Estrada
Noah Gartner
Grace Michailides

Design of a Reef-Safe Sunscreen Manufacturing Process using Mineral UV Filters
Vivienne Gaus
Lindsey Hui
Maria Mozeleski
Maya Sheridan

Creating Activated Carbon from Coconut Shells
McKenna Horner
Kyle Norberg
Shaylen Rice
Dejin Zhu

Fluidized Catalytic Cracking of Fuel Oil for Gasoline Production
James Joubert
Bert Moklebust
Cole Pepin
Jake Trovato
Robert DiScuillo

Ibuprofen Synthesis
Ella Junge
Brianna Marandola
Savanna Sheffield



CIVIL ENGINEERING

PROF. LEON THIEM, PROF. GEORGE TSIATAS,
CHRISTOPHER DUHAMEL, PE, PLS, PRINCIPAL AT DIPRETE ENGINEERING

1:00-4:00 Project Presentations in FCAE 120

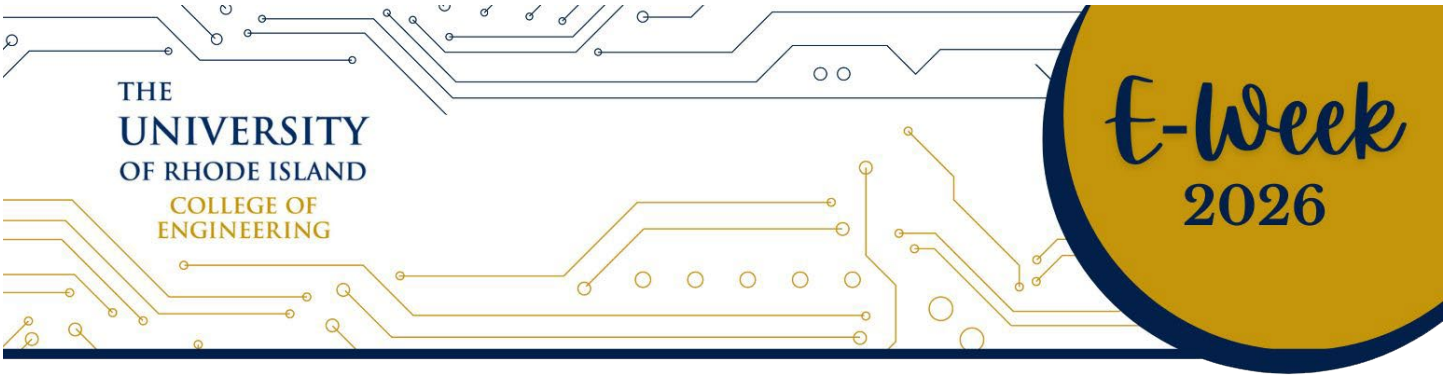
This year's capstone project consists of a four parcel development located in the Tiverton, RI Industrial Park. The four teams are each assigned to one of the following designs: hotel, ice rink, multipurpose sports arena, and super sports car vault with a café. All teams have student subject matter experts in site design, structural, environmental, geotechnical, and transportation engineering.

ACE: Anchor Consulting & Engineering
Lacey Bowen, Project Manager/Strucutral
Abby Clarke, Structural
Euan Wilkie, Structural
Tommy Vinagre, Site Civil
Jason Kasper, Site Civil
Jorday Saris-Baglama, Geotechnical
Gracyn Kane, Geotechnical
Trinity Saab, Environmental
Michael Robinson, Environmental
Jaymori Leonard, Transportation
Nick Brewer, Transportation

Keaney Blue Solutions
Tyler Sheedy, Project Manager/Environmental
Braeden Perry, Geotechnical
Kyle Tomaskovic, Environmental
Mark Blanc, Geotechnical
Paul Barlow, Transportation
Liam Henn, Structural
Nathan Field, Site Civil
Gavin Ellis, Structural
Nick Lombardo, Site Civil
Robert Cermele, Structural
Patrick Muczko, Site Civil

Ocean State Civil Engineering
Logan Carson, Project Manager/Geotechnical & Env.
Aaron Keene, Geotechnical & Environmental
Adriana Abby, Structural
Aiden Sylvestre, Structural
David Samoa, Transportation
Francesco Ferraro, Site Civil
Jake Tragna, Transportation
Julian Gama, Transportation
Kylee Whelan, Site Civil & Structural
Leah Pion, Structural
Shane Keene, Environmental

401 Frameworks
Perry Francis, Project Manager
Axcell Collins, Geotechnical
Ryan Amoroso, Environmental
Chad Mayne, Structural
Nathan Jette, Geotechnical
Audrey Paquet, Environmental
Faith Blanchard, Environmental
Olly Jimenez, Site Civil
Payton Hill, Structural
Jack Nihill, Transportation
Gianni Palombo, Geotechnical
Charlie Gee, Site Civil
Joey Scott, Geotechnical
Jordan Miranda, Transportation



ELECTRICAL AND COMPUTER (ELECOMP) ENGINEERING

PROF. HARISH SUNAK

1:00-4:00 Project Presentations and Demos in FCAE 150

The ELECOMP Capstone Design Program promotes a dynamic collaboration between senior engineering students and industry sponsors and faculty researchers to design, build, program and test solutions to real-world problems. Students gain valuable experience as they apply theory to practice, while industry sponsors benefit from introductions to young talent and the innovative solutions presented. This experience is educational, exciting and productive for both the student teams and industry sponsors. Such collaboration prepares our students for positions with top companies and provides innovative solutions to our industry sponsors' most pressing problems. The students' abilities to introduce new technologies, tools, processes, designs and academic rigor should not be overlooked.

Boston Scientific – Real-time Procedural Visual Aids
Jarrett DeFreitas, Noah Vargas

DBV Technology – DigiTrap (An Intelligent Lobster Trap)
Anna Civitillo, Jacob Phillips, Kevin Vu

Draper Laboratory – Edge Computing on GPUs for Ground Robotics
Ben Gulezian, Sarah Eisenstein, Mckenna Sylvester

Draper Laboratory – Safety Critical Applications for RISC-V Platforms
Shane Stamp, Jamie Iglesias

General Dynamics Electric Boat – Remote Power Control/Monitoring and Solid-State Protective Devices
Danny Haigh, Rafael Heagney, Robert Schmitt

Rite-Solutions – Shipyard 4.0 Security & Resiliency
Garrett Kemper, Aryana Sadr, Laila Ghazi

SANCTUARI – Project Alpha India 2 (MV/AI for Wildlife Rehabilitation)
Grey Daly-LaBelle, Jackson Albro

SANCTUARI – Project Echo Mike 3
Douglas Fisher, Sophie Plante, Brian Cam Farmer

Taco Comfort Solutions – Hot Water Recirc Hybrid Cross-Over Zone Valve
Owen Morelli, Maxwell Gleadow, Gabriel Arabik

URI ARCS Lab – OFDM-Sense: 2D Localization Leveraging OFDM Signals
O'Malley Sherlock, Royaljohn Southammavong

URI Capstone Laboratory – Multi-Channel Electrical Stimulation Circuits
Jarad DeMarco, Thomas Vrankar

URI Cypher Research Center – ADAMANT
Isaac Feldmann, Jacob Lee, Ricky DiMare, Alejandro Wu, Milan Koshy

URI Intelligent Control & Robotics Lab – RoboToy
Jack Petrarca, Gage Testa, Cade Birrell, Joseph Rose

URI Power Electronics Laboratory – IDEA iPEBB Innovative Design Automation
Marc Delgado, Daeven Goel, Nicholas Rossi, Maximus Matarese

Vicor Corporation – Prober Error Tracking and Evaluation Resource
Evan O'Neill, Robbie Stevens

Vicor Corporation – RMA/FSI Work Instructions
Danilo Semedo

VoltServer – CLEAR (LED Sequential Communication Protocol Application)
Ryan Tattrie, Joshua Pereira

XMOS – XNAV: Realtime Robotic Control on xcore.ai
Emily Katz, Aidan Donnellan, Zachary Weinstein

XMOS – XROS: Porting Micro ROS to xcore.ai
Lyneth Mendoza, Abigail Tadamala, Jacob Mathews

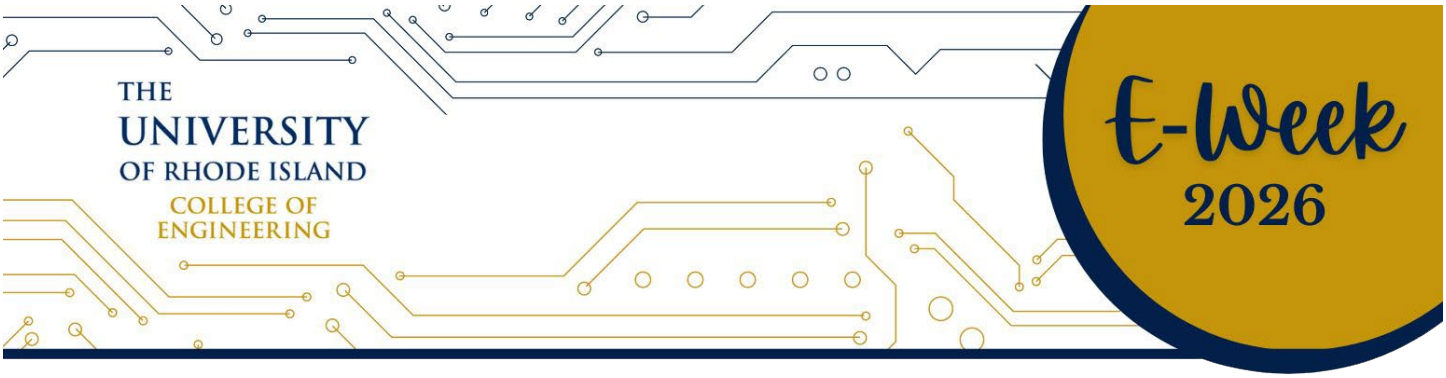
Zebra Technologies – AI/ML Object Recognition and Analysis
Richard Buckley, Sergio Herrera, Jacob Silva

Zebra Technologies – Peltier-Based Thermal Control System for Printhead
Jimmy Prior, Racquel Raphael, William Lucas

Zebra Technologies – Resonance Project
Nathan Vierkant, Davis Rodov, Destiny Moua

Zebra Technologies – Torque Measurement
Cole Giordano, Daniel Sanguino

Zebra Technologies – Universal Printhead Fixture
Kyle Ludwig, Liam Hudak, Yasumin Vongvilay



INDUSTRIAL AND SYSTEMS ENGINEERING

PROF. MANBIR SODHI

1:00-4:00 Project Presentations and Demos in FCAE 180 and 180A

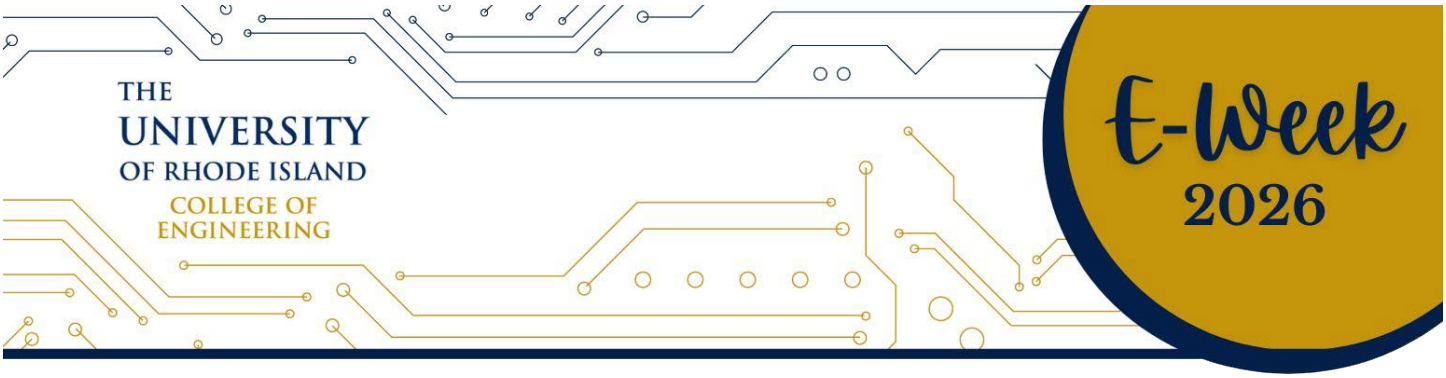
The Industrial & Systems Engineering Capstone Design Showcase consists of five projects with a wide range of different focus areas. Teams of two to four students are tasked with investigating the problem and defining specific measurable deliverables to be achieved by the completion of the two-semester course sequence. Teams develop project plans, meet regularly, document their meetings with actions and deadlines, present the findings to both academic and outside audiences, and prepare intermediate and final reports. The emphasis is on teamwork and project management, intended to closely simulate the workplace environment. For projects linked to industry partners, the students are expected to work directly with corporate representatives and ensure the desired deliverables are achieved from the partner's perspective. Research-based project teams conduct literature reviews to identify the current state of the topic and explore future directions for investigation.

Battery Second Life
Students are conducting controlled discharge experiments to study lithium-ion battery degradation under varying load conditions. The project focuses on data-driven modeling of State of Health and State of Charge to better predict battery performance over time. Ongoing results are being used to refine testing protocols and support battery reuse and repurposing strategies. At the showcase, the team presents experimental data, models, and insights into sustainable energy applications.
Students: Domenick Iadevaia and Oluwatosin Okele

Big Brothers Big Sisters Logistics Automation
Students are developing a data-driven decision-support system to improve donation bin placement and collection logistics for Big Brothers Big Sisters. The project evaluates candidate locations near schools and community hubs while balancing accessibility, routing efficiency, and operational cost. Using historical routing data and estimated pickup volumes, the team is building a tool that allows rapid simulation of multiple placement scenarios. At the showcase, visitors can view the prototype interface and explore how alternative bin strategies impact routes and costs.
Students: Tommy Stapleton, Grace Marrier, and Hailey Haberman

Big Brothers Big Sisters Smart Routing and IoT Expansion
Building on prior work, this project expands a LoRa-based communication network to support smart donation bin monitoring and routing. Students are deploying gateways to address coverage gaps and integrating live field data into a centralized dashboard. The system aggregates estimated bin volumes and connectivity data to support routing decisions. Showcase demonstrations include live data feeds and visualizations illustrating network performance and routing impacts.
Students: Jeremy Herrera Santos, Michael D'Orazio, and Nathan Jolicoeur

Hexagon Metrology Scanner Integration
This capstone modernizes dimensional inspection laboratories by transitioning from traditional CMM-based exercises to scanning arm technology. Students are designing test parts, introducing intentional defects, and developing standardized inspection procedures for GD&T and surface analysis. The project includes the creation of instructional materials and lab protocols, which are being pilot tested. Showcase displays include scanned parts, inspection workflows, and examples of lab materials under development.
Students: Sam Miller and Noah Daylor



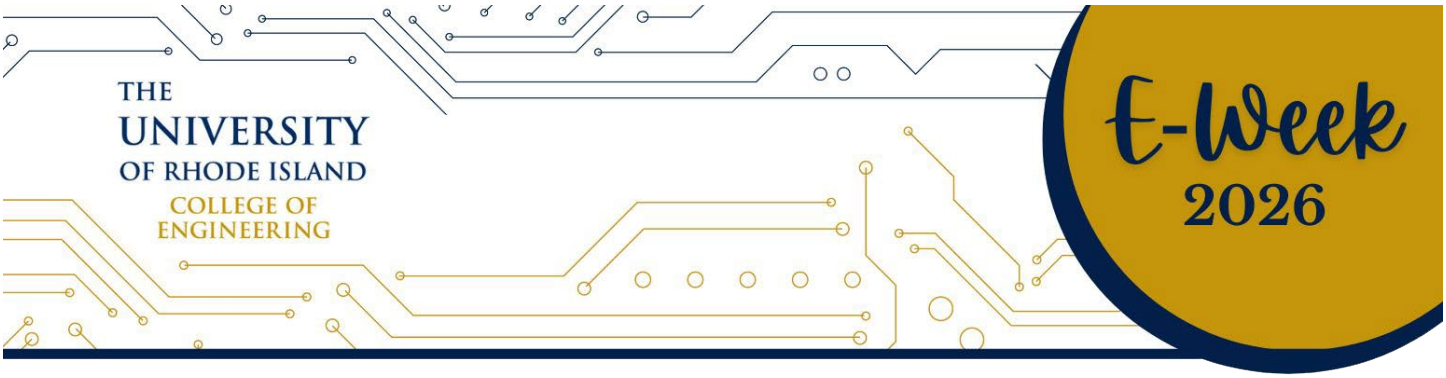
Manufacturing Execution Systems (MES)
Students are implementing a Manufacturing Execution System that connects shop-floor data with higher-level operational decision-making. The project involves mapping workflows, defining real-time data capture requirements, and designing dashboards that visualize key performance indicators. Current work focuses on system integration and live monitoring of production status and traceability. Showcase visitors can interact with dashboards and see how real-time manufacturing data supports operational insight.
Students: Melany Tabares, Rachael Honegger, Jake Yacovacci, Ben Conti, and Juan Lopez

Rapid Prototyping Through Machining Automation
This project develops an RFID-enabled inventory tracking system that automates item identification and location updates. Students are integrating read–write RFID stations with a centralized database and designing efficient information flows using industrial engineering methods. Error-proofing and process optimization are key focus areas. At the showcase, the team demonstrates the working RFID system and how it improves visibility and accuracy in inventory management.
Students: Andrew Oxley and Jackson Largy

RFID-Based Inventory Database
This project develops an RFID-enabled inventory tracking system that automates item identification and location updates. Students are integrating read–write RFID stations with a centralized database and designing efficient information flows using industrial engineering methods. Error-proofing and process optimization are key focus areas. At the showcase, the team demonstrates the working RFID system and how it improves visibility and accuracy in inventory management.
Students: Christian Gemma, Austin Kilduff, and Samantha Murphy

Rite-Solutions Digital Twin: Shipyard 4.0 Security and Resiliency
In collaboration with Rite-Solutions, students are building a cyber-physical digital twin of shipyard operations. The project integrates CNC equipment, material handling, sensors, and a synchronized digital model to support operator dashboards and vulnerability analysis. The team is exploring cyber-physical attack scenarios and mitigation strategies to improve system resiliency. Showcase demonstrations include the physical testbed, digital twin synchronization, and examples of security-focused analyses.
Students: Nic Keegan and Connor Sheridan

Swarm Vehicle Operations
This project investigates decentralized control through the development of autonomous vehicle swarms using Arduino Alvik robots. Students are implementing and testing coordination strategies for distributed task allocation, navigation, and collective behavior. Both simulation and physical experiments are used to study scalability and robustness. Visitors can observe swarm behaviors in action and see how simple local rules lead to coordinated global outcomes.
Students: Juan Zubieta Lombana, Sasha Belovsky, and Jared Cardinali



MECHANICAL ENGINEERING

PROF. BAHRAM NASSERSHARIF

12:00-3:00 Project Presentations and Demos in FCAE 010C, 025C, 155

Team 1: NUWC – UUV Recovery System and Test Fixture Design
Nicholas DiNatale, David N. Ferreira, Zack R. McBrine, Kenny Sposato, Connor D. Theroux

Team 2: NUWC – Methodology for the Autonomous Deployment of a Capsule from an Underwater Host
Anthony J. Caruso, Matthew Gutekunst, Emily V. Lopez, Jack Stadtman, Gianluca Calgaro

Team 3: NUWC – Connection Survivability under High Stress Situations
Alex Araujo, Jerrick J. Pajimna, Liam F. Rowland, Riley D. Shannon, Joseph T. Truong

Team 4: NUWC – Scalable UUV Variable Ballast System
Nick L. Abreu, Megan K. Corbari, Olin W. Guck, Conor P. Sweeney, Cooper M. Newton, Michala Abela

Team 5: NUWC – Environmentally Friendly Amphiphilic Polyurethanes as Anti-Biofouling Coatings
Casey A. Collins, Monroe C. Macuch, Aidan M. Madura, Parker H. McGregor, Rosario Apa

Team 6: Toray – A6 Waste Film Grinder Rotor Removal Rigging Project
Carl Bennett, Brandon K. Cipolla, Jiacheng Kang, Adam J. Lurgio, Benjamin Prew

Team 8: BN/PPL – Design of a Nuclear Power Plant for Electrifying an AI Data Center
Darian F. Clay, Nick E. DiFazio, Robert L. Schuster

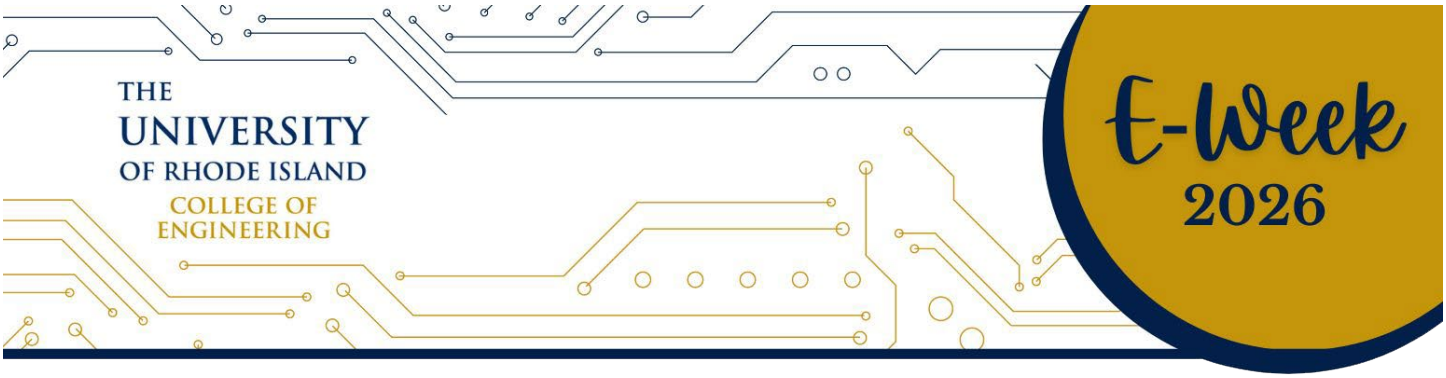
Team 9H: BN/NASA – 10,000 RPM Internal Turbine for CNTR
John Butler Basner, Cameron J. Gillette, Aidan T. Hefele, Cal L. Mahoney, Christopher Peters, Isaiah M. Smith

Team 10: BN/NASA – Hydrogen Propellant Flow Around Nuclear Fuel Tubes for CNTR
David A. Cox, Karl Lauture, Kojo B. Pinkrah, Michael A. Rietze, Max Lowe, Elijah Spencer

Team 11: MagSeal – Design Engineer: Mechanical Rotary Face Seals (Aerospace)
Raul Fithian, Dilly R. Lapointe, Zachary R. Lopes, Maria N. Morrow, Victor Suon

Team 12: US Navy / NOSSA – Fast Heating Test System
Karl J. Gruseck, Landin D. Lessard, JD Mickel III, Nick A. Plants, Peter W. Scangas

Team 13: US Navy / NOSSA – Slow Heating Oven
Evan A. Macaulay, Matt R. Maroney, Sean P. Martin, Kat Whewell, Gianna D. Piemonte



Team 14: NUWC – UUVs Using Sound Detection
Ethan H. Carpio, Casey Cooper, Daniel A. Ginsburg, Preston Jacob, Riley Nicholls

Team 15: NUWC – Methodology for Camouflaged Underwater Storage
Megan M. Hebert, Jacob E. Langlois, Bryson Malaby, Abby Rose Szumita

Team 16: Hexagon – Rail Inspection Programs on a Romer Absolute Arm
Noah C. Dorgan, Andrew T. Harris, Alexander E. Travison

Team 17H: RTX (Raytheon) – Unmanned Autonomous Vehicle (UAV) Control Surface Mechanism
Tyler S. Dickson, Connor J. Ham, Elias Newall-Vuillemot, Cole B. Rinne, Evan M. Trombley, Joseph Matakanace

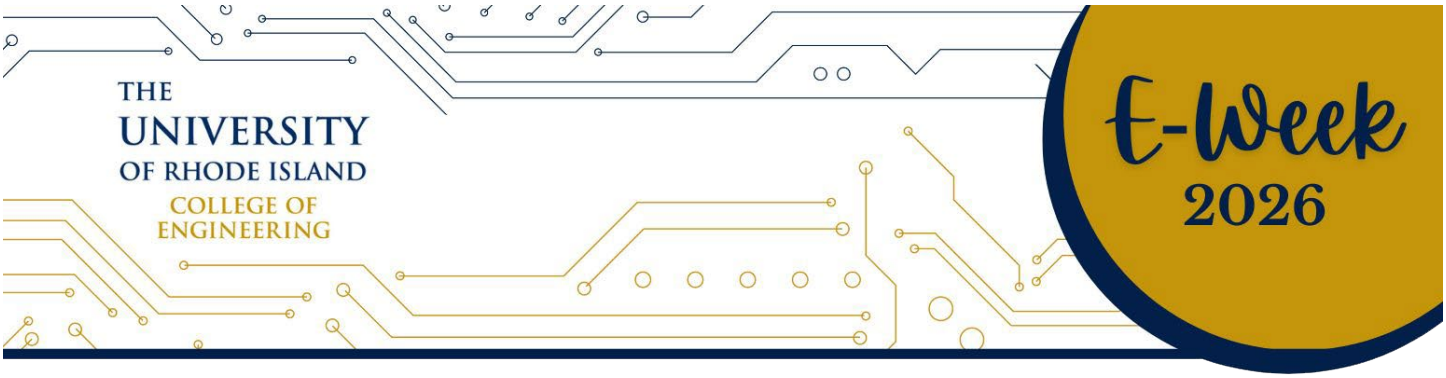
Team 18: BN/NASA – Lunar Base Nuclear Power System
Liam J. Donnelly, Anthony J. Nardolillo, Alex D. Sawyer, Emma C. Sprague, Haleigh A. Wagner

Team 19: BN – Invent Something 1
Nate C. Babineau, Alexander DeStefano, Finn Cobh Forrest, Samantha Vallance, Joseph Matakanace, Riley Nicholls

Team 20: BN – Invent Something 2
Colton P. Kingsbury, Alex A. Lambert, Ray P. Marsella

Team 21H: BN/GD-EB – Rogue Radiation Source Sniffer Autonomous Robot
Jonathan Budzenski, Layhla A. Morales, Abigail Owusu Afriyie, Incendium Price, Glen Sleczkowski Jr.

Team 22: Hexagon – Multi-Axis Laser Interferometry Measurement of Granite Dovetails
Nick J. Campbell, Jiahao Guo, Ian A. Colson



OCEAN ENGINEERING

1:00-4:00 Project Presentations and Demos in Toray Commons

Team 1: MussachuckCreek, Barrington, RI and Elizabeth Brook, Newport, RI Flood Risk Reduction
Students: Samantha Kipper, Matthew Francisco, Christian Dame, Justin Weber, Daniel Preston, Harrison Cotton, Alex Handy (CVE), Will Cornwall (CVE)
Advisors: Mehrshad Amini, Chris Baxter, Malcolm Spaulding, Craig Swanson

Team 2: Artificial Reef Design for Coastal Protection
Students: Katherine Aaronsen, Bailey Bolton, Evan Houle, Michaela Montalvo (CVE)
Advisors: Stephan Grilli, Che-Wei Chang

Team 3: A SONAR Equipped Video Survey System
Students: Sena McManus, Jack Ferns, Brenna Fissell, Emma Turano
Advisors: Lora Van Uffelen, Gopu Potty, James Miller, Kathy Vigness-Raposa

Team 4: Sailing Spar Buoy Scale Model
Students: Calvin Lyons, Willem Weinberg, Adam Strobridge, Magnus Kohler
Advisors: Chris Roman, Stephen Licht

Team 5: Imaging Systems for Deep-Sea Biological Sampling
Students: Andrew Baccari, McKenzie Ezell, Susanna Majkut, Keegan Zelano
Advisors: Brennan Phillips

Team 6: Quiet Towing Tank Carriage Design
Students: John Zambarano, Olin Thompson, Mathhew Superczynski
Advisors: Jason Dahl, Bradford Knight