

10
YEARS



ENGINEERING

Design Showcase

Senior Capstone and First-Year Cornerstone Projects

04.25.17



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING



ArcelorMittal

Welcome to the Annual Department of Engineering Education Engineering Design Showcase!

Thank you for joining us at the Engineering Design Showcase sponsored by the Department of Engineering Education (EED) and ArcelorMittal. The showcase is a platform for undergraduate students to display their capstone or fundamentals of engineering cornerstone projects and to answer questions about their research, design methods and project experience.

10th Annual Engineering Capstone Design Showcase Senior engineering students spend one to two academic semesters on their capstone projects which culminate their undergraduate academic experience at The Ohio State University. The more than 200 capstone projects displayed are individual, multidisciplinary or industry-sponsored projects. Students will be present to answer questions about their research, design methods and capstone experience.

14th Annual Fundamentals of Engineering for Honors (FEH) Research Showcase: FEH nanotechnology projects will also be on display during the Showcase. Sixteen first-year Cell Entrapment and Novel Sensing Endeavors (CENSE) teams were challenged to design a lab-on-a-chip device to detect a disease from a blood sample and solve a real-world medical problem. The device must be able to capture and detect a specific biomarker from a single drop of blood and contain nano-sized features. The CENSE teams will present their research findings.

We hope you enjoy learning more about our students and their academic research. Please enjoy the showcase!

Agenda

- 12:00 p.m. Design Showcase Opens**
Ohio Union, Archie Griffin Grand Ballroom
- Welcome and Introduction
Bob Rhoads, Multidisciplinary Capstone Design
Program Director
- Presentation to Showcase Sponsor
ArcelorMittal
- 3:00 p.m. Showcase Project Winners Presentations**
Bob Rhoads, Multidisciplinary Capstone Design
Program Director
- 3:30 p.m. Closing Remarks**

14th Annual Nanotechnology Fundamentals of Engineering for Honors Research Showcase

Fundamentals of Engineering for Honors Nanotech Cornerstone Projects

X Teams –

- 1** **Students:** Adam Benway, Josh Goetze, Lauren Kachurik,
Emily McDonel
Faculty Advisor(s): Paul Clingan
- 2** **Students:** Rachel Braun , Lindsey Clemmons , Michael Darby,
Dennison Min
Faculty Advisor(s): Paul Clingan
- 3** **Students:** Justin Hopkins, Jimmy Overmeyer, Anna Phillips,
Jeffrey Simon
Faculty Advisor(s): Paul Clingan
- 4** **Students:** Sahithee Batchu, Abbey Bush, Hannah Kern,
Curtis Pierson
Faculty Advisor(s): Paul Clingan
- 5** **Students:** Cassie Boutelle, Ian Gray, Sera Kitchen, Jake Sabia
Faculty Advisor(s): Paul Clingan
- 6** **Students:** Joanne Ash, Izzy Benintendi, Max Williams,
Gus Workman
Faculty Advisor(s): Paul Clingan
- 7** **Students:** Harper Calhoun, Mara Cass, Nathan Smith,
Brian Zaborszki
Faculty Advisor(s): Paul Clingan
- 8** **Students:** Alex Fan, Waseem Naboulsi, Peter Schmitz,
Allison Whitney
Faculty Advisor(s): Paul Clingan

Y Teams –

- 9** **Students:** Bryce Bridges, Nicholas Gawry, Shreya Nalluri,
Priyanka Tewani
Faculty Advisor(s): Lauren Corrigan
- 10** **Students:** JP Dahms, Jack Eifert, Marissa Ruzga,
Anders Sondergaard
Faculty Advisor(s): Lauren Corrigan
- 11** **Students:** Matthew Herkins, Amanda Slager, Morgan Smith,
Ashley Venturini
Faculty Advisor(s): Lauren Corrigan
- 12** **Students:** Morgan Hyland, Neel Lachhwani, Monir Moghaddas,
Tara Wilson
Faculty Advisor(s): Lauren Corrigan
- 13** **Students:** Christy Caporale, Bethany Clotz, Vincent Eramo,
Benjamin Rudzinski
Faculty Advisor(s): Lauren Corrigan
- 14** **Students:** Peter Dent, Andrew Drake, Luis Gomes-Ortega,
Jeremy Janota
Faculty Advisor(s): Lauren Corrigan
- 15** **Students:** Katherine Bradshaw, Emily Demmert, Kero Eldeeb,
Emily Wollman
Faculty Advisor(s): Lauren Corrigan

1st Annual Nanotechnology for Standards Research Showcase

Fundamentals of Engineering for Standards Nanotech Cornerstone Projects

16 **Group M**

Students: Carolyn Croke, Molly Cogan, Matthew Clement

Faculty Advisor(s): Alexis Ortiz-Rosario

17 **Group Q**

Students: Thomas Porter, Bryan Hagedorn, Kristin Billstrand,
Asia Bond

Faculty Advisor(s): Alexis Ortiz-Rosario

10th Annual Engineering Capstone Design Showcase

Student Major Key

ACCT	Accounting
AE	Aerospace Engineering
AGBUS	Agricultural Business
ApECON	Applied Economics
BME	Biomedical Engineering
BUS	Business
CBE	Chemical & Biomolecular Engineering
CIS	Computer Information Systems
Cog-Nero	Cognitive Neuroscience
CSE	Computer Science & Engineering
ECE	Electrical & Computer Engineering
ECO	Ecological Engineering
ECON	Economics
ENG	English
EP	Engineering Physics
FABE	Food, Agricultural & Biological Engineering
FE	Standard Fundamentals of Engineering
FEH	Fundamentals of Engineering for Honors
FIN	Finance
GIS	Geographic Information Science
IB	International Business
Ind Des	Industrial Design (Columbus College of Art & Design)
IS	Information Systems
ISE	Industrial & Engineering
LA	Landscape Architecture
LOG MGMT	Logistics Management
ME	Mechanical Engineering
MIS	Management Information Systems
MSE	Material Science & Engineering
NEURO	Neuroscience
OP MGMT	Operational Management
OT	Occupational Therapy
PH	Public Health
POLI-SCI	Political Science

Aerospace Engineering

160

AEROSPACE ENGINEERING LAB DEVELOPMENT

Students: Alec Basile (AE), Andrew Goldin (AE), Michael Holaday (AE), Isaac McDermott (AE), Braden Miller (AE), Eric Myeroff (AE)

Faculty Advisor(s): Jim Gregory, Cliff Whitfield

Industry Sponsor: The Ohio State University

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161

AERODYNAMIC EFFICIENCY ANALYSIS ON A HYBRID CYCLOIDAL ROTOR

Students: Seth Epstein (AE), Elliot Lee (AE), Jim Ritz (AE), Mitch Boehm (AE), Chris Bowman (AE), Tiauyi Hu (AE)

Faculty Advisor(s): Matthew McCrink, Cliff Whitfield

Industry Sponsor: The Ohio State University

162

ANALYSIS OF THE EFFECTS OF FIN CANT ANGLE

Students: Bryce Huber (AE), Ryan McLaughlin (AE), Stephanie Webber (AE), Erich Zahn (AE), Tallin Forshey (AE)

Faculty Advisor(s): Jen-Ping Chen, Cliff Whitfield

Industry Sponsor: Buckeye Space Launch Initiative

163

CUSTOM DESIGNED CONVERGENT-DIVERGENT ROCKET NOZZLE

Students: Bryant Hicks (AE), Ryan Antone (AE), Troy Shilt (AE), Clinton Rosa (AE), Matt Costello (AE)

Faculty Advisor(s): Jen-Ping Chen, Cliff Whitfield

Industry Sponsor: The Ohio State University

164

DESIGN/BUILD/FLY PROPELLER PROPULSION PERFORMANCE

Students: Nicholas Horn (AE), Cameron Aitken (AE), Nick Keegan (AE), Chris Fung (AE), Nate McCoy (AE)

Faculty Advisor(s): Matthew McCrink, Cliff Whitfield

Industry Sponsor: Ohio State Design/Build/Fly

165 HYBRID WING

Students: Ian Shapiro (AE), Cody Brooks (AE), Quinten Henricks (AE), Nick Plewacki (AE), Brennan Behr (AE)

Faculty Advisor(s): Greg Rhodes, Cliff Whitfield

Industry Sponsor: The Ohio State University

166 JETCAT NOZZLE SUPERSONIC REDESIGN

Students: Robert Rizzuto (AE), Tom Krajnak (AE), Luke Burgett (AE), Dmitriy Dorfman (AE), Drew Squires (AE)

Faculty Advisor(s): Randall Mathison, Cliff Whitfield

Industry Sponsor: Air Force Research Laboratory

167 PROPULSIVE FUSELAGE CONCEPT

Students: Kevin Williams (AE), Austin Beyers (AE), Blake Reinke (AE), Kevin Chenault (AE), Apoorva Chaulal (AE), Clay Vincent (AE)

Faculty Advisor(s): Jacob Allenstein, Cliff Whitfield

Industry Sponsor: The Ohio State University

168 RACING STAND-UP PADDLE BOARD DESIGN IMPROVEMENT

Students: Rodrigo Auza (AE), Aaron Becks (AE), Khalid Blata (AE), Mike Ditzler (AE), Daniel Guillermo (AE), David Januzzi (AE)

Faculty Advisor(s): Zachary Riley, Cliff Whitfield

Industry Sponsor: Project 908

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169 RETROFITTING WINGLETS TO THE C-130

Students: Bryan Kolpitcke (AE), Matt Aultman (AE), Gabe Fidder (AE), Noor Afifa Mohd Hanafiah (AE), Will Pordash (AE), Sean Owen (AE)

Faculty Advisor(s): Rick Freuler, Jacob Allenstein, Cliff Whitfield

Industry Sponsor: The Ohio State University

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170 UAV ENGINE AIR PARTICLE SEPARATOR

Students: Alex Stankovic (AE), Thor Wolford (AE), Anthony Sarachene (AE), Douglas Fritz (AE), Colton Lapworth (AE)

Faculty Advisor(s): Robin Prenter, Ryan Lundgreen, Cliff Whitfield

Industry Sponsor: The Ohio State University

- 180 VENTED SUPERSONIC PROJECTILE**
Students: Scott Weiss (AE), Brandon Lundeen (AE), Kaitlin McTague (AE), Gabe Scherer (AE), Jensen Eric (AE)
Faculty Advisor(s): Datta Gaitonde, Cliff Whitfield
Industry Sponsor: The Ohio State University
- 181 WING EFFICIENCY FOR SUAS APPLICATIONS**
Students: Kegan Buchhop (AE), Matthew Arnott (AE), Michael Strauch (AE), Andrew VanFossen (AE), Vincent Funari (AE)
Faculty Advisor(s): Matthew McCrink, Cliff Whitfield
Industry Sponsor: The Ohio State University

Biomedical Engineering (Assistive Devices)

- 148 ADAPTIVE KAYAK SEAT FOR SMALL FRAMED INDIVIDUALS WITH QUADRAPARETIC/PLEGIC CEREBRAL PALSY AND SIMILARLY PRESENTING DISABILITIES**
Students: Megan Rodewald (ME), Tom Ebner (ME), Regan Roshetko (ME), Carolyn Wang (BME), Jordyn Sesock (OT)
Faculty Advisor(s): Tanya Nocera, Theresa Berner
Industry Sponsor: The Ohio State University
- 147 ADAPTIVE RUNNING CHAIR**
Students: Megan Hughes (ME), Kyler McDonald (ME), Delanie Garman (BME), Lily Lou (BME), Adam Steinle (BME)
Faculty Advisor(s): Mark Ruegsegger, Sandra Metzler
Industry Sponsor: Team Heart and Sole
Industry Contact(s): Georgeann Haviland, Mike Weisenberger
- 143 ATTACHABLE EQUIPMENT-CARRYING DEVICE FOR USE WITH MANUAL RIGID WHEELCHAIR**
Students: Derrick Lin (BME), Bob Stricko (BME), Jack Harrington (BME), Aashish Kandel (BME), Alec Elder (BME)
Faculty Advisor(s): Tanya Nocera, Theresa Berner
Industry Sponsor: NICHD R25
Industry Contact(s): Mark Ruegsegger

- 144 AUTOMATED HAND HYGIENE COMPLIANCE SYSTEM**
Students: Jonathon Davis (BME), Caroline Lieser (BME), Kathryn Schubauer (BME), Jacob Spiker (BME), Zheng Hong Tan (BME), Josh Tublin (BME)
Faculty Advisor(s): Mark Ruegsegger, Daniel Vazquez
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger
- 145 AUTOMATED VOLUMETRIC URINE MEASUREMENT DEVICE**
Students: Megan Ireland (BME), Usama Khan (BME), Nathan Lamba (BME), Nick Pelz (BME), Taylor Schriver (BME)
Faculty Advisor(s): Mark Ruegsegger, Daniel Vazquez
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger
- 196 BLOOD PUMP DESIGN FOR ENDONASAL SURGERY SIMULATOR**
Students: Preethi Chidambaram (BME), Eun-Mae Lee (BME), Benjamin Stocker (BME), Abd Al-Rahman Traboulsi (BME), Angelita Zacharias (BME)
Faculty Advisor(s): Mark Ruegsegger, Sanjeet Rangarajan
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger
- 146 CELL IMAGING ADAPTOR FOR OBSERVATION OF PLATELET ADHESION UNDER DYNAMIC FLOW**
Students: Tori Barnhouse (BME), Christian Blough (BME), Byron Carper (BME), Stefani Montelone (BME), Jonathan Von Stein (BME)
Faculty Advisor(s): Mark Ruegsegger
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger
- 149 CHAIRISH IT: CHAIRS FOR SPECIAL NEED STUDENTS**
Students: Brad Gershkowitz (BME), Patrick Flannery (ME), Jack Mannarino (BME), Meghann Meyer (BME), Jamal Perry (ME)
Faculty Advisor(s): Mark Ruegsegger
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger

- 150 CHILD STEERING DEVICE**
Students: Katelyn Ricci (ME), Chet Peters (ME) Daniel Simons (BME), Emily Watson (BME), Blain Jones (BME)
Faculty Advisor(s): Mark Ruegsegger
Industry Sponsor: Katelyn's Kloset
Industry Contact(s): Heather Bennett
- 151 COPD MONITOR**
Students: Kelsey Watts (BME), Ben Synder (ME), Lahiru Wimalasena (BME), Grant Schneider (BME), Sansriti Saxena (ME)
Faculty Advisor(s): Mahasti Rittinger, Mark Ruegsegger
Industry Sponsor: The Ohio State University
Industry Contact(s): Mark Ruegsegger
- 152 INTERCHANGEABLE PROSTHETIC END EFFECTOR**
Students: Rongsheng Ning (ME), Gabbi Bondra (ME), Emmanuel Babayemi (ME)
Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine
Industry Sponsor: The Ohio State University
- 197 LUNG-ON-A-CHIP**
Students: Nina Tang (BME), Jesse Keckler (BME), Ryan Yu (BME), Brianna Marselle (BME), Anthony Mitchell (BME)
Faculty Advisor(s): Mark Ruegsegger, Samir Ghadiali
Industry Sponsor: The Ohio State University
- 198 MOTORIZED STAGE FOR IN-PLANE MECHANICAL STRAIN APPLICATION**
Students: Matthew Becker (BME), Derrick Huang (BME), Andrew Piscioneri (BME), Taylor Yeater (BME), Kaden Zachmann (BME)
Faculty Advisor(s): Mark Ruegsegger, Yi Zhao
Industry Sponsor: The Ohio State University

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- 153 NOVEL DEVICE FOR POWER SEAT INTERFACE WITHIN AN ADAPTIVE VAN**
Students: Justin Bishop (ME), Matt Fuerst (ME), Connor Longworth (ME), Jasveer Sandhu (ME), William Brokaw (ME)
Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine
Industry Sponsor: The Ohio State University

154 PNEUMATIC VEST AND SUPPORTIVE SEAT BACK TO ASSIST EQUINE THERAPY PARTICIPANTS WITH CEREBRAL PALSY OR SIMILAR PRESENTING SYMPTOMS

Students: Stephen Zenobia (ME), Devon Whitted (BME), Aya Kozono (ME), Lena Schmidt (BME), Kathryn Kaltenmark (BME)

Faculty Advisor(s): Mark Ruegsegger, Tanya Nocera

Industry Sponsor: The Ohio State University and Dreams on Horseback

Industry Contact(s): Mark Ruegsegger, Tanya Nocera, Josie Drushal

159 PHYSICAL THERAPY SENSORY FEEDBACK MAT

Students: Brian Davidson (BME), Deepti Gupta (BME), Cory Stein (BME), Zack Miglich (ME), Anna Gardiner (ME)

Faculty Advisor(s): Mark Ruegsegger

Industry Sponsor: The Ohio State University and Dublin City Schools (Physical Therapist)

Industry Contact(s): Brooke Holdgreve

155 THE PORTABLE PATIENT LIFTING FRAME

Students: Ryan Hutcheson (BME), Leslie Mamula (ME), Amy Schnupp (ME), Jesse Serafin (ME), Brent Weiss (ME), Hailey Booth (OT)

Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine

Industry Sponsor: NICHD R25

156 VEHICLE CONTROL INTERFACE

Students: Alexander Cetnar (BME), Louis Chua (BME), Michael Donizetti (BME), Jared Grubaugh (ME), William Hendrix (BME), Nathaniel Wood (ME)

Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine

Industry Sponsor: The Ohio State University

157 VETERINARY HEAD-HOLDING DEVICE FOR ADMINISTERING STEREOTACTIC RADIATION THERAPY

Students: Emily Aulby (BME), Chris Baggott (BME), Danielle Lynd (ME), John Swartzwelder (ME), Tommy Sandwisch (BME)

Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine

Industry Sponsor: NICHD R25 and The Ohio State University

- 158 WHEELCHAIR SAFETY SYSTEM**
Students: John Bullock (ME), Bernard Cook (BME), Srisai Mediseti (BME), Tatiana Sedlak (BME), Kerry White (BME)
Faculty Advisor(s): Sandra Metzler, Carmen DiGiovine
Industry Sponsor: The Ohio State University

Chemical & Biomolecular Engineering

- 122 AERATION OF A SUBDIVISION POND**
Students: Matt Pilsner (CBE), Charles Quallen (CBE), Corey Hickman (CBE), Justin Smith (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Carlo Scaccia
- 123 ALTERNATIVE PROCESS FLOW SYNTHESIS OF ABE FERMENTATION**
Students: Jay Thaxton (CBE), Mazie Mandia (CBE), Mitchell Dille (CBE), Lejia Peng (CBE)
Faculty Advisor(s): Mandar Kathe, David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Mandar Kathe
- 124 ANALYSIS OF GLUCOSE TO FRUCTOSE ISOMERIZATION FOR BIOMASS CONVERSION**
Students: Anjelica Kucinic (CBE), Jordan Ward (CBE), Corey Kane (CBE), Jacob Simko (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Nicholas Brunelli
- 125 CALCIUM PROPIONATE FERMENTATION FROM WHEAT AND RICE FLOUR**
Students: Donny Kusuma (CBE), Zack Newell (CBE), Seth Niemi (CBE), Gabrielle Nogueira Meza (CBE)
Faculty Advisor(s): Mandar Kathe, David Tomasko
Industry Sponsor: OSU Bioprocess and Tissue Engineering Research Group
Industry Contact(s): Shang-Tian Yang

- 126 CHEMICAL LOOPING SYNGAS GENERATION**
Students: Connor Barber (CBE), Nick Singstock (CBE), Keaton Greeley (CBE), Leo Chen (CBE)
Faculty Advisor(s): Andrew Tong, David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Andrew Tong
- 127 CO2 SELECTIVE MEMBRANES**
Students: Sal Alshabani (CBE), Shannon Kopcha (CBE), Rachael Campo (CBE), John Coffey (CBE)
Faculty Advisor(s): Winston Ho, David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Dongzhu Wu
- 128 COMPUTER SIMULATION AND EXPERIMENTAL STUDIES TO DEVELOP A MIXING EXPERIMENT FOR UNIT OPERATIONS LAB**
Students: David Socha (CBE), Geoffrey Ashburn (CBE), Jason Rubin (CBE), Piotr Szablicki (CBE)
Faculty Advisor(s): Mandar Kathe, David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Jeffrey Chalmers
- 129 DEVELOPING A SCALABLE DISSOLVED OXYGEN FILTER MODEL USING THE OXYRASE® ENZYME SYSTEM**
Students: Athanasios Burlotos (CBE), Joshua Fouasnon (CBE), Jana Kise (CBE), Emily Nevoraski (CBE)
Faculty Advisor(s): Jeffrey Chalmers
Industry Sponsor: Oxyrase
Industry Contact(s): Casey Zace
- 130 ECONOMIC MODELING OF NEXT-GENERATION AUTOMOTIVE FUEL CELLS**
Students: Entela Duka (CBE), Joe Flaherty (CBE), Sabrina Horsham (CBE), Matthew Rees (CBE)
Faculty Advisor(s): David Tomasko, Bhavik Bakshi
Industry Sponsor: phMatters
Industry Contact(s): Paul Matter, Mike Beachy

131 ENERGY RECOVERY FROM VOC RECLAMATION
Students: Gabrielle Young (CBE), Colin Giacalone (CBE), Katie Gustafson (CBE), Rachel Littman (CBE)
Faculty Advisor(s): David Tomasko

132 ENTRAINER BASED DISTILLATION OF ACYLNITRILE-ACETONITRILE
Students: Lynn Bakes (CBE), Cynthia Sanchez (CBE), Nick Lee (CBE), Drew Connally (CBE), Lexi Cantu (CBE)
Faculty Advisor(s): David Tomasko, Mandar Kathe
Industry Sponsor: The Ohio State University
Industry Contact(s): Mandar Kathe

133 EVALUATION AND OPTIMIZATION OF A CONTINUOUS DISTILLATION COLUMN
Students: Edward Sieradzki (CBE), Zach James (CBE), Jessica Villagran (CBE), Mary-Kate Wintz (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: Watershed Distillery
Industry Contact(s): Greg Lehman

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137 IMPLEMENTING PUMP CURRICULA IN THE UNIT OPERATIONS LABORATORY
Students: Savannah Moses (CBE), Rasha Rashid (CBE), Sarah Halmi (CBE), Benjamin Crum (CBE)
Faculty Advisor(s): Jeffery Chalmers, David Tomasko
Industry Sponsor: The Ohio State University

134 OPTIMIZATION OF RECOVERY FOR SUPERCRITICAL EXTRACTION OF CANNABIS
Students: Kory Sherman (CBE), Andrew Kelo (CBE), Austin Lavy (CBE), Kurt Jacobs (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: Apeks Supercritical
Industry Contact(s): Jeremy Sexton

135 OXIDATIVE COUPLING OF METHANE
Students: Claire Basham (CBE), Kyle Miller (CBE), Madison Hammerberg (CBE), William Drees (CBE)
Faculty Advisor(s): Andrew Tong, Deven Baser
Industry Sponsor: The Ohio State University

- 136 PLATE & FRAME FILTRATION**
Students: Anthony Hoover (CBE), Alan Babinec (CBE), Joe Geers (CBE), Lane Flora (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: Capital Resin Corporation
Industry Contact(s): Michael Denney
- 138 PROCESS OPTIMIZATION FOR ORGANIC TECHNOLOGIES**
Students: Jane Whitten (CBE), Lauren Wilhelm (CBE), Enrico Cahyadi (CBE), Richard Pawlowski (CBE)
Faculty Advisor(s): Jeffrey Chalmers
Industry Sponsor: Organic Technologies
Industry Contact(s): Tyler Hacker
- 139 PRODUCTION OF BUTANOL FROM CELLULOSIC BIOMASS BY CLOSTRIDIAL FERMENTATION**
Students: Mohammad Hashmi (CBE), Michael Stenta (CBE), Caleb Colvin (CBE), Joel Matthews (CBE)
Faculty Advisor(s): Shang-Tian Yang
Industry Sponsor: The Ohio State University
Industry Contact(s): Shang-Tian Yang
- 140 PRODUCTION OF DIMETHYL CARBONATE THROUGH CARBON DIOXIDE**
Students: Chris Garrison (CBE), Vincent Mazzone (CBE), Jay Mota (CBE), Alex Miller (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Nicholas Brunelli
- 141 SCALE-UP PROCESS FOR THE SYNTHESIS OF 5-HYDROXYMETHYLFURFURAL**
Students: Marissa Schroeder (CBE), Yihang Wu (CBE), Jeremy Smith (CBE), Eileen Elliot (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: The Ohio State University
Industry Contact(s): Nicholas Brunelli

- 142 TSA FOR RECOVERING ENERGY FROM LANDFILL GAS**
Students: Zehan Yu (CBE), Sania Khan (CBE), Matt Pyo (CBE), Lauren Biggs (CBE)
Faculty Advisor(s): David Tomasko
Industry Sponsor: Adsorption Research, Inc
Industry Contact(s): Kent Knaebe

Civil & Environmental Engineering

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- 36 CITY OF COLUMBUS HAP CREMEAN WATER PLANT (HCWP) & DUBLIN ROAD WP (DRWP) UV DISINFECTION UPGRADES**
Students: TBA
Faculty Advisor(s): Linda Weavers, Timothy Wolfe
Industry Sponsor: City of Columbus
Industry Contact(s): Rick Westerfield, Mark Eppich

Computer Science & Engineering

- 19 AIRLINE SIMULATOR**
Students: Dongjo Ban (CIS), Gregory Bomkamp (CSE), Joe Call (CSE), Kyle Justice (CIS), Andrew McSurley (CSE)
Faculty Advisor(s): Moez Chaabouni
Industry Sponsor: Center for Aviation Studies
Industry Contact(s): Adam Beckman
- 20 AMAZON ECHO**
Students: Weicheng Huang (CIS), Haifan Ou (CIS), Wen Gu (CIS), Huichen Yuan (CIS)
Faculty Advisor(s): Murthy Narasimhan
Industry Sponsor: Cloudnbeyond LLC
Industry Contact(s): Chakravarthy Balaji
- 28 AULD CORPORATION FINGERPRINTER**
Students: Brae Baumgartner (CSE), Jamie Silva (CIS), Catie Talbot (CSE), Alex Vavra (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: Auld Corporation
Industry Contact(s): Dan Auld

29 **AUTOMATIC ANALYSIS OF POTENTIAL RISKS IN UNDERWRITING USING MACHINE LEARNING**
Students: Jimmy Chau (CSE), Tyler Prince (CIS), Stephen Ross (CSE), Gregg Schoen (CSE)
Faculty Advisor(s): Murthy Narasimhan
Industry Sponsor: Nationwide Insurance
Industry Contact(s): Jawahar Talluri

30 **AUTOMOTIVE ENGLISH PROGRAM**
Students: Joey Chagnon (Math & CIS), Winnie Li (CSE), Sabrinah Halkiu (ENG), Ryan Bates (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: Jackie Gishbaugher

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31 **CAPITALIZE**
Students: Josh Nieman (CSE), Derek Plautz (CSE), Joe Van Gundy (CSE)
Faculty Advisor(s): Perumal Ramasamy
Industry Sponsor: NetJets, Inc.
Industry Contact(s): Karthik Muthusamy

32 **CONFUCIUS**
Students: Joe Pappas (CSE), Tyler Li (CSE), Sayeed Siddiqui (CSE), William Zhang (CSE), Soren Goyal (CSE)
Faculty Advisor(s): Stephen Boxwell
Industry Sponsor: IBM
Industry Contact(s): Stephen Boxwell

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183 **CONQUERED COMMAND**
Students: Nick Curto (CIS), Brett Arthur (CSE), Bryan Arnold (CSE), Josh Clark (CSE), Andrew Petrilla (CSE), Claudia Moeller (CSE)
Faculty Advisor(s): Roger Crawfis
Industry Sponsor: The Ohio State University
Industry Contact(s): Roger Crawfis

33 **CONSIDER - STUDENT INTERFACE**
Students: Daniel Stelson (CSE), Alan Zeigler (CSE), Pavle Coric (CSE), Edrienne Co (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: The Ohio State University
Industry Contact(s): Swaroop Joshi, Neelam Soundarajan

34 CONSIDER - INSTRUCTOR INTERFACE

Students: Frederick Gu (CSE), Alex Thomas (CSE), Jordan Wurth (CSE), Mike Yamada (CSE)

Faculty Advisor(s): Alan Cline

Industry Sponsor: The Ohio State University

Industry Contact(s): Swaroop Joshi, Neelam Soundarajan

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184 COUCH PARTY RACING

Students: Matt Bartholomew (CSE), John Butts (CSE), John Cramer (CSE), Kyle Powers (CSE), Connor Swick (CSE)

Faculty Advisor(s): Roger Crawfis

Industry Sponsor: The Ohio State University

Industry Contact(s): Roger Crawfis

35 DIGICLIPS

Students: Kevin Payravi (CSE), Asad Iqbal (CSE), Austin Alexander (CSE), Eunjai Kim (CSE)

Faculty Advisor(s): Moez Chaabouni

Industry Sponsor: DigiClips Broadcast Monitoring

Industry Contact(s): Robert Shapiro, Henry Bremers

37 DEPENDENCY ANALYSIS WITH DATA VISUALIZATION

Students: Sam Shutt (CSE), Eric Olson (CSE), Andrew Lee (CSE), Nick Carroll (CSE)

Faculty Advisor(s): Murthy Narasimhan

Industry Sponsor: Nationwide Insurance

Industry Contact(s): Jawahar Talluri

38 EDUSOURCED – GRAPHICAL REPORTING AND ANALYTICS

Students: Bryon Foltz (CSE), Emily McIntyre (CSE), Anthony Weston (CIS), Jessica Gillespie (CSE)

Faculty Advisor(s): Moez Chaabouni

Industry Sponsor: EduSourced

Industry Contact(s): Dan Thiery

39 FEEDSIGHTS: SOCIAL MEDIA RESEARCH APPLICATION

Students: Dalton Mankin (CSE), Reece Holl (CSE), Jack Manzler (CSE)

Faculty Advisor(s): Perumal Ramasamy

Industry Sponsor: NetJets, Inc.

Industry Contact(s): Karthik Muthusamy

40 FRUGAL: IMPLEMENTING IBM'S WATSON TO ANALYZE CURRENT STOCK SENTIMENT

Students: Aaron Benson (CSE), Daniel Cunningham (CSE), Margaret Gilbert (CSE), Evan Kozliner (CSE), Josh Thomas (CSE)

Faculty Advisor(s): Stephen Boxwell

Industry Sponsor: IBM

Industry Contact(s): Stephen Boxwell

185 GOLDEN FORCE: TACTICS

Students: Cam McCuen (CSE), Sage Pearson (CIS), Kevin Spiers (CSE), Parth Thaker (CSE), Clint Yoos (CSE)

Faculty Advisor(s): Roger Crawfis

Industry Sponsor: The Ohio State University

Industry Contact(s): Roger Crawfis

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41 HANDS-ON DASHBOARD

Students: Adam Tyler (CSE), Jennifer Barry (CSE), Matt Weiss (CSE), Tadas Varaneckas (CSE)

Faculty Advisor(s): Suribabu Jayanti,

Industry Sponsor: HandsOn Central Ohio

Industry Contact(s): Beth Lonn, Carl Konopka, Krishna Manda

182 HEY MAVIC

Students: Zhuoer Wang (CSE), Zhichao Yang (CSE), Keao Xu (CSE), Chen Cai (CSE), Zhiyue Yang (CSE)

Faculty Advisor(s): Stephen Boxwell

Industry Sponsor: IBM

Industry Contact(s): Stephen Boxwell

42 iBOT VIRTUAL ASSISTANT

Students: Xiao Liang (CIS), Yang Liu (CSE), Yun Ma (CIS), Xuzhou Yin (CSE)

Faculty Advisor(s): Perumal Ramasamy

Industry Sponsor: NetJets, Inc.

Industry Contact(s): Branden Bellanca

43 INTELLIGENT MIXED REALITY 2.02

Students: Patrick Veith (CSE), Kyla Bouldin (CSE), Jennifer Hong (CSE), Cameron Toben (CSE)

Faculty Advisor(s): Moez Chaabouni

Industry Sponsor: EduTechnologic

Industry Contact(s): Brad Henry, Austin Gilliam

- 44 IMR FRONT END**
Students: Benjamin Stammen (CSE), Viral Patel (CSE), Leonard Yang (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: EduTechnologic
Industry Contact(s): Brad Henry, Austin Gilliam
- 45 LIFE INSURANCE CHAT WITH WATSON**
Students: Bernie Skubak (CSE), Thomas Dail (CSE), Tony Tenuta (CSE)
Faculty Advisor(s): Murthy Narasimhan
Industry Sponsor: Nationwide Insurance
Industry Contact(s): Jawahar Talluri
- 46 LOXI**
Students: Mark Naderer (CIS), Amber Harriger (CSE), Samuel Maddox (CSE), Michael Johnston (CSE)
Faculty Advisor(s): Murthy Narasimhan
Industry Sponsor: Lantrasoft
Industry Contact(s): Kavi Nithyanandam
- 47 MIGR8**
Students: Sam Farren (CSE), Cameron Long (CSE), Daniele Bellutta (CIS), Kamari Wright (CSE)
Faculty Advisor(s): Stephen Boxwell
Industry Sponsor: The Ohio State University
Industry Contact(s): Stephen Boxwell
- 48 MYARDINA**
Students: Matthew Cramblett (CIS), Drew Gallagher (CSE), Crystal Ceballos (CIS), Charles Green (CIS)
Faculty Advisor(s): Alan Cline
Industry Sponsor: Ardina
Industry Contact(s): Shaun Young
- 49 NETJETS LINE STATION MAINTENANCE**
Students: Daniel Miller (CSE), Blake Howard (CSE), Kyle Hutchinson (CSE), Chad Schnipke (CSE)
Faculty Advisor(s): Perumal Ramasamy
Industry Sponsor: NetJets, Inc.
Industry Contact(s): Karthik Muthusamy, Jason Gregory

50

NODE WALKER

Students: Julie Green (CIS), Matias Grotewold (CSE), Jake Haynes (CSE), Eva Naumoff (CSE)

Faculty Advisor(s): Murthy Narasimhan

Industry Sponsor: Peruse Labs

Industry Contact(s): Velusamy Velu

51

OUTLOOK 2.1

Students: Matt Migdal (CSE), Chris McManamon (CSE), Illifilza Rusli (CSE)

Faculty Advisor(s): Moez Chaabouni

Industry Sponsor: Outlook

Industry Contact(s): Brad Henry

52

OUTLOOK ASSISTANT CHAT BOT

Students: William Van Der Laar (CSE), Daniel da Rosa (CSE), Tammy Joseph (CSE)

Faculty Advisor(s): Perumal Ramasamy

Industry Sponsor: NetJets, Inc.

Industry Contact(s): Vladimir Tkachenko

53

POWERSAGE INSTALLER ANDROID APPLICATION

Students: Saad Asim (CSE), Christian Deiderich (CSE), Lana Yusuf (CSE), Zachary Schroeder (CSE)

Faculty Advisor(s): Alan Cline

Industry Sponsor: PowerSage

Industry Contact(s): Tom Roberts

54

POWERSAGE PROPERTY MANAGER APP

Students: Arron Christie (CSE), Pallavi Kalva (CSE), Monish Sangtani (CSE)

Faculty Advisor(s): Alan Cline

Industry Sponsor: PowerSage

Industry Contact(s): Tom Roberts

55

POWERSAGE PROPERTY MANAGER DASHBOARD

Students: Trenton Gibson (CSE), Braden Polly (CSE), Vincent Young (CSE), Rubin Zhang (CIS)

Faculty Advisor(s): Alan Cline

Industry Sponsor: PowerSage

Industry Contact(s): Tom Roberts

- 56 POWERSAGE RESIDENT APPLICATION**
Students: Dustin Dieker (CSE), Daniel Lambert (CSE), Kenny Schmitt (CSE), Chaoqun Guo (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: PowerSage
Industry Contact(s): Tom Roberts
- 186 PROJECT HOSTAGE NEGOTIATION**
Students: Alexander Sarrouh (CSE), Connor Wood (CSE), Gerard Puhalla (CSE), Nate Borak (CSE), Brandon Moore (CSE)
Faculty Advisor(s): Steve Boxwell
Industry Sponsor: IBM
Industry Contact(s): Steve Boxwell
- 57 REALWEAR AR**
Students: Kelly McCleese (CIS), Yuze Chen (CSE), Alec Workman (CSE), Wesley Pettit (CSE), Howell McCullough (CSE)
Faculty Advisor(s): Suribabu Jayanti
Industry Sponsor: EduTechnologic
Industry Contact(s): Brad Henry
- 58 REALWEAR MOBILE APP**
Students: Kellen Anker (CSE), Kyle Williams (CSE), Adam Wolfe (CSE)
Faculty Advisor(s): Suribabu Jayanti
Industry Sponsor: EduTechnologic
Industry Contact(s): Brad Henry
- 59 REALWEAR VOICE-TO-TEXT AND COGNITIVE SERVICES INTEGRATION**
Students: Lauren Miller (CSE), Jacob Smiddy (CSE), Thomas Pendley (CSE), Nolan Rudolph (CSE)
Faculty Advisor(s): Suribabu Jayanti
Industry Sponsor: EduTechnologic
Industry Contact(s): Brad Henry

- 60 ROCK CLIMBING GAME**
Students: Eric Soppi (CSE), Ryan Niemocienski (CSE), Nathan Krebs (CSE), Landon Grim (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: The Ohio State University
Industry Contact(s): Roger Crawfis
- 187 SHADES OF XENDALIA: ABOLITION**
Students: Liam Montmorency (CSE), Ken Hayes (CSE), Sandeep Battula (CSE), Alex Schilling (CSE)
Faculty Advisor(s): Roger Crawfis
- 188 SHURGEKEN**
Students: Adam Kimble (CSE), Chris Leight (CSE), Albert Maah (CSE), Nicolas Re (CSE), Kristopher Wenger (CSE)
Faculty Advisor(s): Roger Crawfis
- 61 SKWEEZE: COGNITIVE JOB SEARCH**
Students: Nick Chehade (CIS), Logan Patino Middaugh (CSE), Yashvardhan Gusani (CSE), Reid Fu (CSE)
Faculty Advisor(s): Stephen Boxwell
Industry Sponsor: The Ohio State University
Industry Contact(s): Stephen Boxwell
- 62 SNUPR**
Students: Alec Haas (CSE), Eric Singh (CSE), Mason Bender (CSE), Jimmy Baker (CSE)
Faculty Advisor(s): Moez Chaabouni, Paul Carlson
Industry Sponsor: SNUPR
Industry Contact(s): Jim Mazotas
- 189 STRATEGIC OPERATIONS CENTER**
Students: Daniel Bedich (CSE), Shantanu Bhardwaj (CSE), Cyriac Domini Thundathil (CSE), Asanka Nanayakkara (CIS)
Faculty Advisor(s): Perumal Ramasamy
Industry Sponsor: NetJets, Inc.
Industry Contact(s): Umesh Vaswani, Perumal Ramasamy
- 63 TOP TIER TRENDS**
Students: Kelly Helmreich (CSE), Ben Oberhaus (CIS), Griffin Solimini (CSE), Alex Winchell (CSE)
Faculty Advisor(s): Stephen Boxwell

- 64 TRIVIA TRAINER**
Students: Michael Schulz (CSE), Evan Danish (CSE), Ross Vasko (CSE), Will Sloan (CSE)
Faculty Advisor(s): Stephen Boxwell
- 65 VIRTUAL CHEMISTRY ASSISTANT**
Students: Prithvi Krishna Muntimadugu (CSE), Kalyan Khandrika (CSE), Thomas Centa (CSE), Ajit Kumar Sahoo (CSE)
Faculty Advisor(s): Suribabu Jayanti
Industry Sponsor: EduTechnologic
Industry Contact(s): Brad Henry
- 66 WATSON TA**
Students: Bill Varcho (CSE), Tyler Zeller (CSE), Livia Stanley (CSE), David Soller (CSE), Dalton Flanagan (CSE)
Faculty Advisor(s): Stephen Boxwell
Industry Sponsor: IBM Watson
Industry Contact(s): Stephen Boxwell
- 67 WL SYSTEM UPDATE**
Students: Connor Hall (CIS), Arinov Marinov (CIS), Chris Hall (CSE), Eric Purvis (CSE)
Faculty Advisor(s): Suribabu Jayanti
Industry Sponsor: Our Lady of Bethlehem Daycare
Industry Contact(s): Lauren Harrington
- 68 XAMARIN MOBILE**
Students: Anthony Pietrantozzi (CSE), Max Pettit (CSE), Tyler Degen (CSE), Eric Yu (CSE)
Faculty Advisor(s): Alan Cline
Industry Sponsor: EduTechnologic, LLC.
Industry Contact(s): Brad Henry, Michael Jodon

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- 190 ZEIVOM**
Students: Evyatar Ben-Asher (CSE), William Greer (CSE), Henok Weldemicael (CSE), Michael Cristina (CSE), Christina Hummel (CIS), Allison Subtelny (CSE)
Faculty Advisor(s): Stephen Boxwell
Industry Sponsor: IBM
Industry Contact(s): Stephen Boxwell

Electrical & Computer Engineering

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178 CONTROLLING HEART RATE THROUGH WEARABLE ELECTRONICS

Students: Tim Heaton (ECE), Tyler Heaton (ECE), Amber Silvaggio (ECE)

Faculty Advisor(s): Ryan McPherson

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179 SMART WEARABLE BODY SENSORS FOR PORTABLE KINEMATICS MONITORING

Students: Ryan Mattei (ECE), Zia Mohammad (ECE and Cog-Neuro), Mike Sidrys (ECE)

Faculty Advisor(s): Asimina Kiourti

Food, Agricultural & Biological Engineering

21 GLOVE DURABILITY TESTING USING GAS FLOW GRADIENTS

Students: Mallory Rowan (FABE), Harsh Patel (FABE), Jerry Xu (FABE), Amelia Pierson (FABE)

Faculty Advisor(s): Jane Fife, Chris Gecik, Katrina Cornish

Industry Sponsor: EnergyENE

Industry Contact(s): Katrina Cornish

224 HIGH RESOLUTION YIELD MAPPING

Students: Troy Steiger (FABE), Jimmy Graham (FABE), Trent Fagrell (FABE), Howard Wang (FABE)

Faculty Advisor(s): Jane Fife, Scott Shearer

Industry Sponsor: Case International Harvester

Industry Contact(s): Scott Shearer

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22 NASA X-HAB RECYCLING OF INEDIBLE PLANT BIOMASS

Students: Tayo Pedro (FABE), John Capuano (FABE), Jamie Heidel (FABE), Ryan Joen (FABE)

Faculty Advisor(s): Peter Ling

Industry Sponsor: National Aeronautics and Space Administration (NASA)

Industry Contact(s): Kim Simpson, Giola Massa, Eirik Holbert

- 23 PLANT WATER DELIVERY SYSTEM FOR MICROGRAVITY AND DEEP SPACE ENVIRONMENTS**
Students: Joshua Abraham (FABE), Usoshi Chatterjee (FABE), Brennan Cordova (FABE), Owen Meehl (FABE)
Faculty Advisor(s): Peter Ling, Jane Fife
Industry Sponsor: National Aeronautics and Space Administration (NASA), Physical and Life Sciences Division
Industry Contact(s): Kim Simpson, Giola Massa, Tracy Gill, Morgan Simpson, John McQuillen
- 24 REEF SYSTEMS**
Students: John Paulson (FABE), Mike O’Connell (FABE), Floyd Wang (FABE), Bobby Greer (FABE), Erin Maher (FABE)
Faculty Advisor(s): Mike Rowan
Industry Sponsor: Reef Systems Coral Farm Inc.
Industry Contact(s): Todd Melman
- 25 RESTORING SLOOPY SWALE TO IMPROVE WATER QUALITY IN THE LOWER OLENTANGY WATERSHED**
Students: Chris Goodwin (ECO), Megan Levine (ECO), Kerri Rogers (ECO), Michelle Rysavy (ECO)
Faculty Advisor(s): Margaret Kalcic
Industry Sponsor: Friends of the Lower Olentangy Watershed
Industry Contact(s): Laura Fay
- 26 UNVERFERTH STRIP-TILLAGE GRANULAR FERTILIZER INJECTION SYSTEM**
Students: Caleb Bale (FABE), Allison Noonan (FABE), Remington King (FABE), Brian Klever (FABE), Rhine Chow (FABE)
Faculty Advisor(s): Andrew Klopfenstein, John Fulton
Industry Sponsor: Unverferth
Industry Contact(s): Shawn Gerdeman
- 27 USING MEMBRANE TECHNOLOGY TO FILTER CIP CLEANING SOLUTION**
Students: Brian Magorien (ECON), Jenny Sanderson (FABE), Kevin Martin (FABE), Daniel Cleveland (FABE), Micheal Jarrell (FABE)
Faculty Advisor(s): Dennis Heldman, David Phinny
Industry Sponsor: Meijer Dairy
Industry Contact(s): Terry Madden, Ted Johannssen

Industrial & Systems Engineering

- 94** **ALENE CANDLES – GLASS CENTRALIZATION**
Students: Arron Alexander (ISE), Meredith Joseph (ISE), Casey Sutherland (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Alene Candles
Industry Contact(s): Brad Colclasure
- 95** **ALENE CANDLES – PACK-OUT LABOR ANALYSIS AND WORKSPACE DESIGN**
Students: Casey Belknap-Summers (ISE), Dan Centa (ISE), Aaron Buskirk (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: Alene Candles
Industry Contact(s): Brad Colclasure, Todd Baran, Rodney Harl
- Best in Design**
- 96** **AMERICAN RED CROSS LOGISTICS VISUALIZATION MODEL**
Students: Tim Rettig (ISE), Nick Tomczak (ISE), Chris Wrobel (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: American Red Cross
Industry Contact(s): Shawn Gardner, Leo DeBandi
- 97** **COLUMBUS CREW SC**
Students: Matt Glasgow (ISE), Robert Gomez (ISE), Austin Wirtz (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Columbus Crew SC
Industry Contact(s): Jordan Enke
- 98** **CREW PAIRING NETJETS**
Students: Jared Brinn (ISE), Claire Deegan (ISE), Ryan Helm (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: NetJets, Inc.
Industry Contact(s): Steve Dennett, Ryan Riesbeck

- 99 CROSSMARK: EMPLOYEE UTILIZATION**
Students: Damon Schneider (ISE), Jaime Gonzalez Brana (ISE), McCay Lloyd (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: CrossMark
Industry Contact(s): Brent Smith
- 100 DEVELOPING A PREDICTIVE SPACE ALLOCATION MODEL FOR ALENE CANDLES**
Students: Tom Barrett (ISE), Annie Greer (ISE), Karam Tatla (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: Alene Candles
Industry Contact(s): Brad Colclasure, Todd Baran
- 101 DEVELOPING A TIRE UNLOADING TOOL THAT IMPROVES DELIVERY DRIVER ERGONOMICS AT DHL**
Students: Michelle Ghitman (ISE), Janesz Ethan (ISE), Tolbert Carolyn (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: DHL Supply Chain
Industry Contact(s): April Lowery
- 102 EFFICIENCY STREAMLINING AND PRODUCT CONTROL**
Students: Seth Bearjar (ISE), Patrick Gallagher (ISE), Wilson Lin (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Commercial Vehicle Group
Industry Contact(s): Jack Feng, Greg Moore
- 103 EXACTER**
Students: Salaheddine Elfakir (ISE), Derek Sasthav (ISE), Nicole Drozdowicz (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Exacter
Industry Contact(s): Steve Engle

- 104 FRANKLIN COUNTY BOARD OF ELECTIONS**
Students: Grace Dolan (ISE), Vincent Hardin (ISE), Jeremiah Lawson (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Franklin County Board of Elections
Industry Contact(s): Zach Manifold
- 105 FSI INSTRUCTOR SCHEDULING OPTIMIZATION**
Students: Matt Alic (ISE), Faye Xiong (ISE), Max Basheda (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: FlightSafety International
Industry Contact(s): Fabio Miguez, Chad Garvin
- 106 HANDS-ON CENTRAL OHIO**
Students: Madie Aichholz (ISE), Maliha Masood (ISE), Dan McKeon (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: HandsOn Central Ohio
Industry Contact(s): Joey Schulte
- 107 IMPLEMENTATION OF PRODUCTION AUTOMATION**
Students: Aaron Vaughn (ISE), Andres Mendoza (ISE), Greg Fette (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: CVG
Industry Contact(s): Omar Lieves
- 108 IMPROVEMENT OF MAINTENANCE CYCLES IN AUTOMOTIVE BODY STAMPING**
Students: Sarah Fisher (ISE), Andrei Morosky (ISE), Andrew Lenzo (ISE)
Faculty Advisor(s): Steve Lavender
Industry Sponsor: Ford Motor Company
Industry Contact(s): Christina Lee, Roger James
- 109 JENI'S PROCESS IMPROVEMENT**
Students: Brad Acord (ISE), Yuhan Jiang (ISE), Michael George (ISE)
Faculty Advisor(s): David Benson
Industry Sponsor: Jeni's Ice Cream
Industry Contact(s): Michael Hilty

110 KEEPING THE KIBBLE ON THE PALLET: A WALMART STORY

Students: Pete Arnold (ISE), Chloe Handelman (ISE), Shauna Hartman (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Walmart

Industry Contact(s): Dana Bergman, Spencer Hidy, Brian Roth

111 LINE BALANCING AT HORTON AMBULANCE

Students: Alex Schroeder (ISE), Jordan Scharf (ISE), AJ Jones (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Horton Ambulance

Industry Contact(s): Josh Niewiadomski

112 LOW COST AGILE TOOLING FOR INJECTION MOLDING

Students: Leah Bartlett (ISE)

Faculty Advisor(s): Steve Lavender, Jose Castro

Industry Sponsor: Honda R&D Americas, Center for Design and Manufacturing Excellence

Industry Contact(s): Ben Hoffman

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113 NETJETS ERGONOMIC SEAT DEVELOPMENT PROJECT

Students: Lauren Buck (ISE), James Axson (ISE), Marissa Fernandez (ISE)

Faculty Advisor(s): David Benson

Industry Sponsor: NetJets, Inc.

Industry Contact(s): Candy Dudik, Sophia Mohr

114 NETJETS INVENTORY LEVEL & DISTRIBUTION PROJECT

Students: Patrick Campbell (ISE), Alex Pires (ISE), Terence Chen (ISE)

Faculty Advisor(s): Krista Trigg

Industry Sponsor: NetJets, Inc.

Industry Contact(s): Edward Perry, David Benson, Ram Cherukuri, Typhon Kronk, Ryan O'Connor

115 NORTH MARKET IMPROVEMENT PROJECT

Students: Tatyana Shapiro (ISE), Jaclyn Thomason (ISE), Brandon LeScoezec (ISE)

Faculty Advisor(s): David Benson

Industry Sponsor: North Market

Industry Contact(s): Rick Wolfe

116 OPTIMIZING INVENTORY LAYOUTS AND HANDLER UTILIZATION

Students: Corey Hunn (ISE), Josh Klaus (ISE), James Birchak (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Navistar International

Industry Contact(s): Shane Stierley, Ryan Warfield, Sneha Vaghela, Stephen Herr, Matt Strayer

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117 OPTIMIZING INVENTORY PLACEMENT AND WAREHOUSE EFFICIENCY

Students: Chris Brajdic (ISE), Emily Caudle (ISE), Jack McCauley (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Rod's Western Palace

Industry Contact(s): Eric Seaman, Brad Woodruff

118 OHIO STATE UNIVERSITY MEDICAL TRANSPORTATION

Students: Ryan Gurney (ISE), Sarah Colasanti (ISE), Mollie Ruffing (ISE)

Faculty Advisor(s): David Benson

Industry Sponsor: The Ohio State University Wexner Medical Center

Industry Contact(s): Sara Stevenson

119 RETOOLING THE BOCCHI LABS SCRAP MEASUREMENT SYSTEM

Students: Fendi Tjoa (ISE), Daniel Hottos (ISE), Mark McCullough (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Bocchi Laboratories

Industry Contact(s): Jeff Stouffer, Ed De Veau

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120 STANDARDIZING PROCESSES AND REDUCING INVENTORY DISCREPANCIES AT BOCCHI LABS

Students: Grace Zhang (ISE), Brett Durborow (ISE), Kacey Turk (ISE)

Faculty Advisor(s): Steve Lavender

Industry Sponsor: Bocchi Laboratories

Industry Contact(s): Jeff Stouffer, Kevin Lee

**121 UNIVERSITY HOSPITAL EAST EMERGENCY DEPARTMENT
FLOW COORDINATOR**

Students: Jeffrey Jagger (ISE), Tommy Reighard (ISE), Zach Warchol (ISE)

Faculty Advisor(s): David Benson

Industry Sponsor: The Ohio State University Wexner Medical Center

Industry Contact(s): Sara Stevenson, Satomi Abe

Industrial & Systems Engineering (Lean Sigma)

**69 BOB EVANS REPAIR AND MAINTENANCE
MANAGEMENT PROJECT**

Students: Andrew Johnson (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Bob Evans

Industry Contact(s): N/A

**70 COMMUNICATION AND KPI IMPROVEMENT FOR THE
NETWORK ASSURANCE GROUP**

Students: Emily Rumford (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Verizon Wireless

Industry Contact(s): Freddie Matson

71 FOAM WASTE COST REDUCTION

Students: Devante Muldrow (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Avnet

Industry Contact(s): Lynne Waldron

72 FOOD WASTE REDUCTION PROJECT

Students: Luis Visoso (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Dublin City Schools

Industry Contact(s): Nathan Rohyans

73 INCREASING RATE REVISION SPEED TO MARKET
Students: Harsh Patel (ISE)
Faculty Advisor(s): Scott Sink
Industry Sponsor: Grange Insurance
Industry Contact(s): Amy Tomaszewski, Aaron Nartker

Best in Design

74 MAKE/BUY STRATEGY IMPLEMENTATION PROJECT
Students: Michael Beardsley (ISE)
Faculty Advisor(s): Scott Sink
Industry Sponsor: Peerless Saw Company
Industry Contact(s): Tim Gase

75 REDESIGNING CPA LAB SPECIMEN HANDLING (FRONT END)
Students: Gianni Bunawan (ISE)
Faculty Advisor(s): Scott Sink
Industry Sponsor: The Ohio State University Wexner Medical Center
Industry Contact(s): Valery Tarver

76 MEMBERS VALUE EXCHANGE OPTIMIZATION
Students: Kevin Budiman (ISE)
Faculty Advisor(s): Scott Sink
Industry Sponsor: IISE Columbus Chapter
Industry Contact(s): Scott Sink

77 REDUCING COOKIE OVER-PACK AT COLUMBUS BAKERY
Students: Daniel Low-Pitroff (MIS)
Faculty Advisor(s): Scott Sink
Industry Sponsor: Kroger Manufacturing
Industry Contact(s): Travis Ross

78 REDUCTION OF NON-VALUE ADD IN RETURNS PROCESS
Students: Vinay Bobba (ISE)
Faculty Advisor(s): Scott Sink
Industry Sponsor: Startech.com
Industry Contact(s): Ted Wenger, Dana Garvey

79 TARRIER STEEL QUALITY MANAGEMENT SYSTEM

Students: Peter Shapiro (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Tarrier Steel

Industry Contact(s): Ben Tarrier

Best in Design

80 TIME IS MONEY: INITIATIVES INTERNAL PROCESS IMPROVEMENT AT UNITED WAY OF CENTRAL OHIO

Students: Christina Steiner (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: United Way of Central Ohio

Industry Contact(s): Matt Kosanovich

81 TURNOVER REDUCTION - EMPLOYEE VALUE EXCHANGE OPTIMIZATION IN HEALTH CARE

Students: Katie Monaghan (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Salo Solutions

Industry Contact(s): Laura Czuba

82 VERIZON REVENUE ASSURANCE VALUE CONTRIBUTION MODEL DEVELOPMENT

Students: Samuel Powers (ACCT)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Verizon

Industry Contact(s): Peter Romanoski, Freddie Matson

83 WIP RACKING SYSTEM REDESIGN

Students: Jennifer Surface (ISE)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Ometek

Industry Contact(s): Paul Siders

84 ZINC SHOT MATERIAL INVENTORY OPTIMIZATION

Students: Robert Seitz (ISE and ECON)

Faculty Advisor(s): Scott Sink

Industry Sponsor: Transmet Corporation

Industry Contact(s): Justin Clarke, Robin Gates

Integrated Business & Engineering

219 AUXI (HYPERPERSONALIZATION SERVICE)

Students: Brian Kulp (CBE), Michelle Li (FIN), Alisa Noll (ISE), Jack Schroder (ISE), Rafael Fernandez (Ind Des), Kevin Ikeda (CBE)

Faculty Advisor(s): Peter Rogers

Industry Sponsor: Procter and Gamble

Industry Contact(s): Russ Speiller, Reg Crutchinald

220 FLOCEL - TBI DIAGNOSIS

Students: Paul dHyver (FIN), Aaron Dadas (BME), Thomas Krajnak (AE), Jordan Lucki (CBE), Joe Kowardy (Ind Des), Melody Liu (FIN)

Faculty Advisor(s): Peter Rogers, Greg Thune

Industry Sponsor: Flocel

Industry Contact(s): Damir Janigro

Best in Design

221 MILLENNIAL LAUNDRY

Students: Amara Barakat (BUS), Bryan Barrett (ISE), Ben Bloom (CSE), Stephanie McLaughlin (Ind Des), Andrew Topinka (BUS)

Faculty Advisor(s): Peter Rogers

Industry Sponsor: Procter and Gamble

Industry Contact(s): Michael Fontaine

222 SOLVING THE JUNK DRAWER

Students: Steven Back (CBE), Collin Stipe (ECE), Eric Vinson (FIN), Rachael Leonard (IS), Evan Painter (Ind Des)

Faculty Advisor(s): Peter Rogers

Industry Sponsor: Stanley Black and Decker

Industry Contact(s): Craig Steinfels

223 VESCO MEDICAL

Students: Laura Duncan (FIN), Brandon Kramer (ME), Kyle Hardin (ME), Bryan Gemler (CBE), Aura Escobar (Ind Des)

Faculty Advisor(s): Peter Rogers, Greg Thune

Industry Sponsor: Vesco Medical

Materials Science & Engineering

201 CONTROLLED BURST RELEASE OF CONTRACEPTIVE DRUGS FROM PCL BLEND ELECTROSPUN CAPSULES

Students: Brandon Borja (MSE), Frank Jin (MSE), Michael Posner (MSE)

Faculty Advisor(s): John Lannutti

Industry Sponsor: Bureau of Land Management

202 GALVANIC CORROSION PREDICTION

Students: Michael Ong (MSE), Tao Yi (MSE)

Faculty Advisor(s): Gerald Frankel

Industry Sponsor: The Ohio State University

203 HEAT TREATMENT AND MICROSTRUCTURE INVESTIGATION OF Ti-Al-Fe-Mn ALLOY

Students: Patrick Kudo (MSE), David Wagner (MSE), Yekai Yu (MSE)

Faculty Advisor(s): Alan Luo

Industry Sponsor: U.S. Department of Energy in collaboration with General Motors

204 HOT ISOSTATIC PRESSING OF THIN WALLED COMPONENTS OF Ti -6-4

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Faculty Advisor(s): Hamish Fraser

Industry Sponsor: Synertech PM

205 INJECTABLE HYDROGELS FOR STEM CELL-BASED HEART TISSUE REGENERATION

Students: Lauren Braswell (MSE), Dylan Wynne (MSE)

Faculty Advisor(s): Jianjun Guan

Industry Sponsor: The Ohio State University

206 MELT 5B - THIN-WALL ALUMINUM DIE CASTING DEVELOPMENT

Students: Andrew Davis (MSE), Logan Little (MSE), Nicolette Voltaggio (MSE)

Faculty Advisor(s): Alan Luo

Industry Sponsor: LIFT Lightweight Innovations, Alcoa

- 207 MICROSTRUCTURE AND STRENGTH OF 304 STAINLESS STEEL AFTER HEAT TREATMENT AT DIFFERENT TEMPERATURES IN THE RANGE OF 680-1000°C**
Students: Aaron Suchanek (MSE), Daniel Spiker (MSE), Maggie Van Keuls (MSE)
Faculty Advisor(s): Steve Niezgodra
Industry Sponsor: Titanium Brazing Inc.
Industry Contact(s): Alexander Shapiro
- 208 PHOTOCATALYTIC REDUCTION OF CO₂ USING SEMICONDUCTING NANOWIRES**
Students: Alex Landis (MSE), Nathan Bratcher (MSE), Dianze Liu (MSE)
Faculty Advisor(s): Tyler Grassman, Patricia Morris, Derek Miller, Mohamad Al-Hashem
Industry Sponsor: The Ohio State University
- 209 THE EFFECT OF ABUTMENT MATERIAL ON WEAR OF INTERNAL ENGAGING FEATURES OF IMPLANTS UNDER CYCLIC LOADING**
Students: Christopher Irwin (MSE), Justin Helton (MSE)
Faculty Advisor(s): Jinwoo Hwang
Industry Sponsor: The Ohio State University
- 210 UNDERSTANDING AND QUANTIFYING THE CORROSION SUSCEPTIBILITY OF UNS C18150**
Students: Alexander Herzog (MSE), Spencer Fries (MSE), Anthony Ulman (MSE)
Faculty Advisor(s): Jennifer Locke
Industry Sponsor: US Navy
Industry Contact(s): Elissa Trueman
- 211 UPCONVERSION AND PHOTOSTABILITY OF OXYGEN-SENSING NANOFIBERS**
Students: Alex Cochran (MSE), Mallory Hutton (MSE), Elana Spiegler (MSE), Maria Stang (MSE)
Faculty Advisor(s): John Lannutti
Industry Sponsor: The Ohio State University

212 VFA SPOT WELDING OF ALUMINUM 5056 AND DP590

Students: Clare Gu (MSE), William Wei (MSE)

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Industry Sponsor: Development of Energy

Mechanical Engineering (Student Design Competition)

85 BUCKEYE CURRENT SUSPENSION CHARACTERIZATION AND CONTROL

Students: Hashem Alsharif (ME), Arnez Franklin (ECE), Mengze Niu (ME), John Poland (ME), James Walsh (ME)

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Industry Sponsor: Center for Automotive Research, The Ohio State University

86 ECOCAR LV POWER REDUCTION

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87 ECOCAR 3 WEIGHT DISTRIBUTION

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88 FSAE ENGINE SIMULATION

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Industry Sponsor: Center for Automotive Research, The Ohio State University

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FSAE STEERING COLUMN

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Industry Sponsor: Center for Automotive Research, The Ohio State University

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TESTING PROCESS DESIGN OF A FSAE VEHICLE

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Industry Sponsor: Center for Automotive Research, The Ohio State University

Mechanical Engineering (General)

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HOOD WELDING RESEARCH

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Industry Sponsor: Center for Design and Manufacturing Excellence, The Ohio State University

Multidisciplinary Design

171

ARCELORMITTAL CLEVELAND STEAM PROCESSING

Students: Cody Fox (CBE), Jillian Zhang (ME), Cheng Meng (ME), Ben Unruh (ECON), Peter Zwyth (ECE) , Abdallah Feras (LA)

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Industry Sponsor: ArcelorMittal

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172 COOPER TIRES - AN EVALUATION OF THE FEASIBILITY OF GUAYULE AGRONOMICS AS AN ALTERNATIVE RUBBER SOURCE

Students: Whitney Smelly (POLI-SCI), Kevin Fisher (SENR), Amjad Chowdhury (CBE), John Beech (AGBUS and ApECON), Kimberly Bonner (OP MGMT), Soni Nischay (CEE and PH)

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Industry Sponsor: Cooper Tires

Industry Contact(s): Zachary Walters

173 COOPER TIRES - AN EVALUATION OF THE ECONOMIC POTENTIAL OF GUAYULE RESIN AND BAGASSE IN THE MARKETPLACE

Students: Christopher Martin (ME), Alexandria Morton (FABE), Hunter Schraer (FABE), Yesharge Abrha (FABE), Amanda Broseus (CBE)

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174 FUTURE AUTOMOTIVE AIR OUTLETS AND VENTS

Students: James Bruno (AE), David Downey (ACCT), Tejaswini Gautham (AE), Daniel Ooi (AE), Fred Ouimet (ME) , Sturgeon Annie (AE), Lavanya Uthaman (AE), Victoria Yee (AE)

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175 HONDA HEALTH MONITORING

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176 JOHN DEERE 7R IVT POWER REVERSER
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177 TOY ADAPTATION PROGRAM (TAP) DEVELOPMENT PROJECT
Students: Jed Abumeri (ENG), Joshua Tovour (GIS), Thomas Yankush (LOG MGMT), Declan Duckworth (LOG MGMT), Harsh Patel (BUS)
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Industry Sponsor: The Toy Adaptation Program

Best in Design

200 VARIABLE HARDNESS OF MOTOR VEHICLE SEATS
Students: Luke Hopkins (CSE), Kaylee Hoffner (MSE), Kaylie Schimming (MSE), Mark Schreck (ME), Hariz Mohdrazzi (ECON), Nicolozakes Athan (BME), Raven Edwards (ECE), George Hoeflerlin (BME), Stefan Subich (IB)
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The College of Engineering at The Ohio State University is a leader in creating and implementing substantive industry experiences for undergraduate engineering students. Our engineering programs have a rich history of using projects developed and sponsored by industry for student capstone design courses. All programs within the College of Engineering require a capstone design experience for graduation. The capstone design course integrates design skills and engineering practice with a focus on authentic design challenges presented and supported by industry partners and faculty. The Department of Engineering Education (EED) fosters industry partnerships with The Ohio State University through EED's Multidisciplinary Capstone Design program and through all engineering departments by connecting companies with appropriate programs.

For more information, visit go.osu.edu/multicap or contact:

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Department of Engineering Education (EED)

The EED advances the engineering profession and enables student success by developing and delivering state-of-the-art, innovative, multidisciplinary engineering courses and programs; by modeling and advocating scholarly, evidence-based teaching within the College of Engineering; and by integrating pedagogical discovery, practice, and dissemination through world-class engineering education research.

The Ohio State University College of Engineering is nationally recognized for its commitment to undergraduate education. Our teaching methods—including practical, hands-on experience through project-based design courses; a focus on providing opportunities for undergraduate research experiences; and individualized attention to students—have proven to effectively facilitate students’ academic and, ultimately, career success.

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The EED provides academic, personal, and professional activities that are designed to supplement the undergraduate experience both inside and outside the classroom. In addition, the EED creates new courses and strengthens existing ones to ensure that students are well prepared for the ever-changing global employment environment.

For more information, visit eed.osu.edu or contact:

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