

EXPERIENCE PURDUE'S

SMART MANUFACTURING LABS



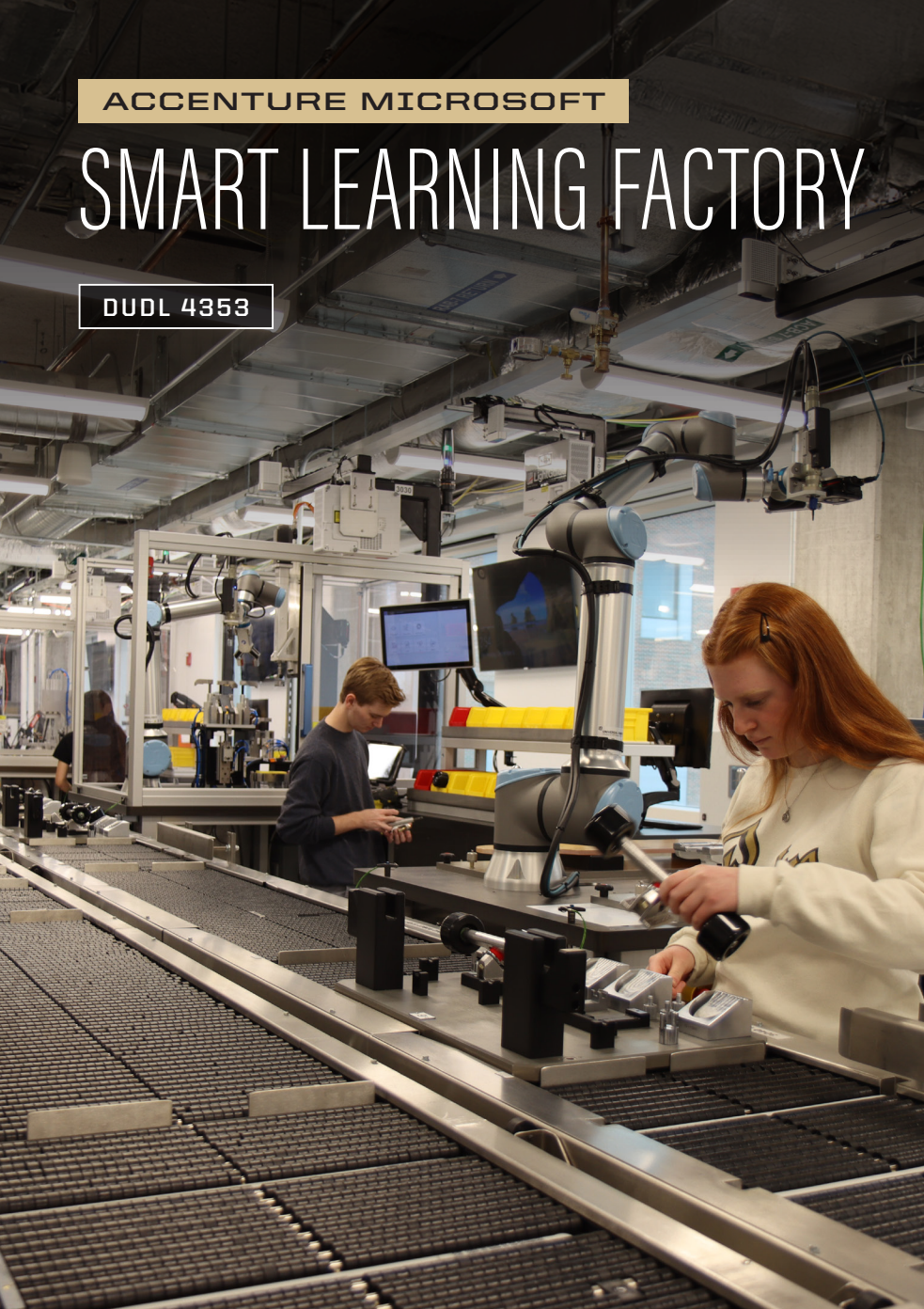
PURDUE
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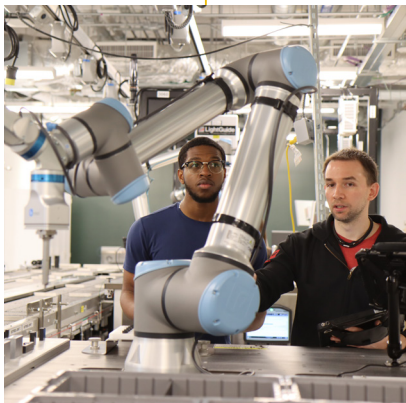
School of Engineering Technology

ACCENTURE MICROSOFT

SMART LEARNING FACTORY

DUDL 4353

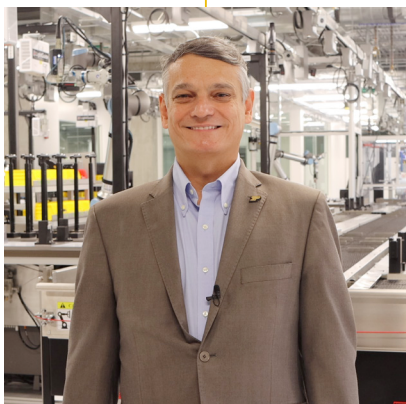




The Smart Learning Factory is an active cyber-physical production system (CPPS) that integrates physical manufacturing equipment with embedded sensors, data, and digital tools in an educational environment. Purdue students design, implement and develop smart manufacturing competencies in an ecosystem of horizontally and vertically integrated processes, while sourcing, designing and optimizing production components.



The lab integrates humans, machines, products and processes alongside resources from over a dozen different Purdue partners in industry. Students use equipment that will greet them in a real manufacturing setting.



“ *We live in a world where technology changes rapidly. The manufacturing industry needs people who are skilled, and can adapt to those changes—and we are teaching them here.*

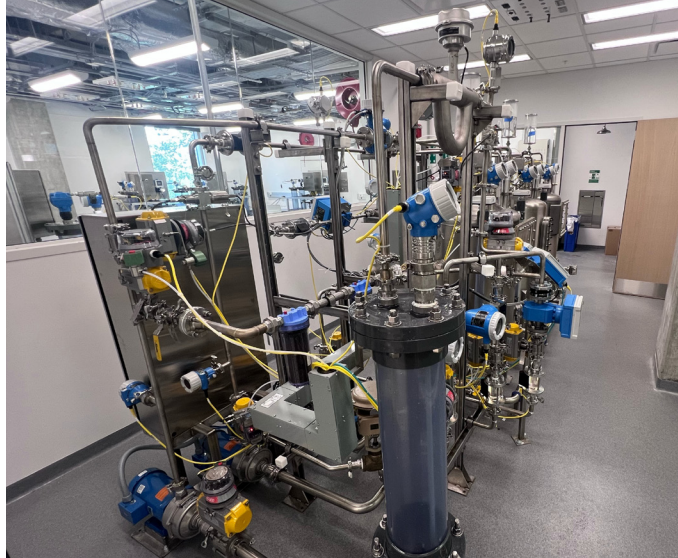
DANIEL CASTRO,
Dean of Purdue Polytechnic

ENDRESS + HAUSER

CONTINUOUS PROCESS LAB

DUDL 4377





Here, students collect data from sensors and devices, perform analytics, create a knowledge database and develop operational intelligence from manufacturing systems. Connecting simulation and virtualization techniques with real-time metrics, they explore process adjustment impacts, identify bottlenecks and optimize performance.

The lab is designed to immerse students in measurements, control and prediction process flows, pressures, levels, and temperatures in an industry-comparable manufacturing environment. The system fosters understanding and development with sensors, data acquisition and process control.

“This lab uses almost every sensor that our sponsor Endress+Hauser makes, so it really does prepare us for working in a real-world setting.

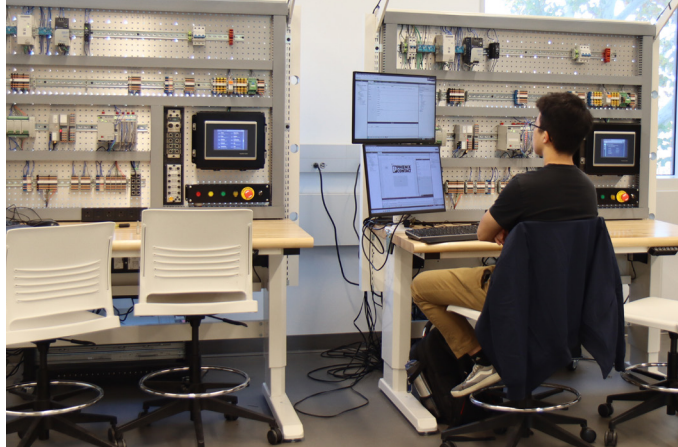
DANNALEE MATA,
Graduate, audio engineering technology

FORTINET & FURNAS FOUNDATION

INDUSTRIAL IOT LAB

DUDL 4383





The Industrial Internet-of-Things Laboratory incorporates the design, prototyping, testing and implementation of applications embedded in the machines that operate in SoET's other Smart Labs, allowing data from products or processes to be exchanged across the lab network. Students use IoT, data, AI, and cloud connectivity to develop applications for remote monitoring, controlling operations across-network and develop intelligent edge computing applications.

Students also study the cybersecurity implications and risks of a networked control system. It is a true laboratory environment; students can safely learn, work, and experiment with software at the bench-level with minimal consequences to the physical and digital systems.

“These labs are real data engines for our students. The goal is to generate tons of info for them to interpret and parse out in the IoT Lab, whether it's coming from the Smart Factory, the Continuous Process Lab, or from our Smart Foundry.

GRANT RICHARDS,

Associate Professor of Practice, manufacturing engineering technology

CATERPILLAR

SMART FOUNDRY

LMBS B239





The Purdue Smart Foundry is an advanced, Industry 4.0 environmentally-conscious sand foundry designed to provide hands-on experience to students in sand testing, molding, pattern making, ferrous and non-ferrous casting, manual and automated metal pouring and data collection. This laboratory is a mixed-use environment, enabling teaching, research, and volume production all in one facility.

In-depth student immersion in molding, casting, and finishing processes enable students to develop competency and efficiency in the fundamental and advanced levels of casting. As they gain experience and confidence with the equipment, they are granted additional responsibility for design, operation and process improvement.

“Our previous foundry was very old-school. Now we get to work with a lot more automation—from the mold-makers, to a robotic crane arm that can maneuver the heated materials. It is a huge upgrade in terms of both the safety features and what we can accomplish.”

LAURA MCKINNON,

Graduate, mechanical engineering technology

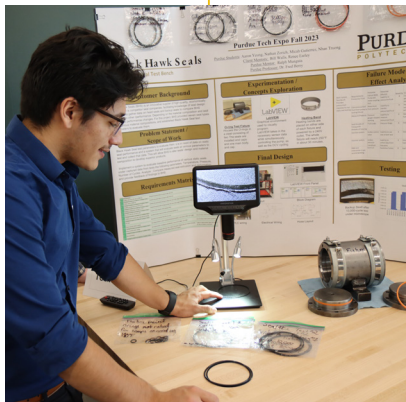
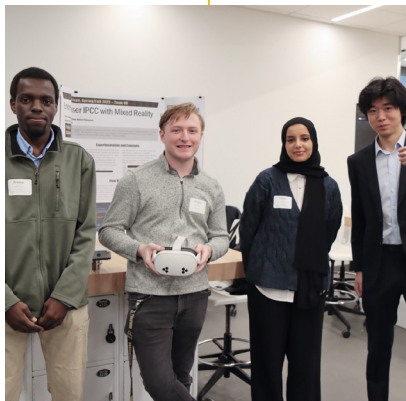
CAPSTONE LAB

LMBS 4247



Seniors in Purdue Polytechnic's School of Engineering Technology must complete a year-long Capstone project in order to graduate—a final assignment to show that they'll be Industry Ready, Day One. We have dedicated space set aside for students to think, collaborate, and build Capstones with their teammates.

Our students use their Capstones to prove that they are genuine innovators. In recent years, teams have not only worked on process improvements for sponsors such as Honda and Amazon, they've even created zero-waste water filtration systems or gravity simulation devices designed to work on the International Space Station—all from scratch.



“Purdue Polytechnic’s great lab facilities and world-class professors prepared me for a real-world manufacturing environment. With the help of the college’s resources, I even got to work with a medical startup to create one of their products from the ground up for my capstone project.”

CONNOR KELLEY,
Graduate, electrical engineering
technology

GUITAR LAB

LMBS 4273





Welcome to Purdue's Guitar Lab, where students design and build their own electric or acoustic guitars from the ground up. Students begin the semester with nothing but a set of raw materials, and end it with a bespoke electric or acoustic guitar made by their own hands.

The class shows Purdue students both in and out of the Polytechnic how to use hands-on approaches to make quality goods that genuinely work. The leadership from mechanical engineering technology faculty member Mark French provides students with an opportunity to develop the technical skills vital for high-quality fabrication of goods. From blueprinting, to machining, to electrical rigging and quality assurance, students learn it all in the Guitar Lab and leave at the end of the semester with a memento of this unforgettable course.

“Students from all majors can come into class and start building, getting involved and running machines. They're able to experience the manufacturing process and say, 'OK, I know how to do this.'”

MARK FRENCH,

Professor, mechanical engineering technology



EPLAN & RITTAL

HELP ROOM

DUDL 5117





This open lab provides 24 fully equipped stations for students to work on homework, lab assignments, and projects. In the evening graduate teaching assistants are available to answer questions about assignments and labs. Each station is furnished with soldering equipment and essential test equipment, including a digital oscilloscope, a low voltage multi-output DC supply, a digital multimeter, and a function generator.

Also provided are the latest computer workstations with a suite of programs for printed circuit board design, analog and digital system simulation, software development, as well as Microsoft Office software such as Word, Excel, and PowerPoint.

H.L. "BEN" BANTON

FLUID POWER LAB

KNOY 114





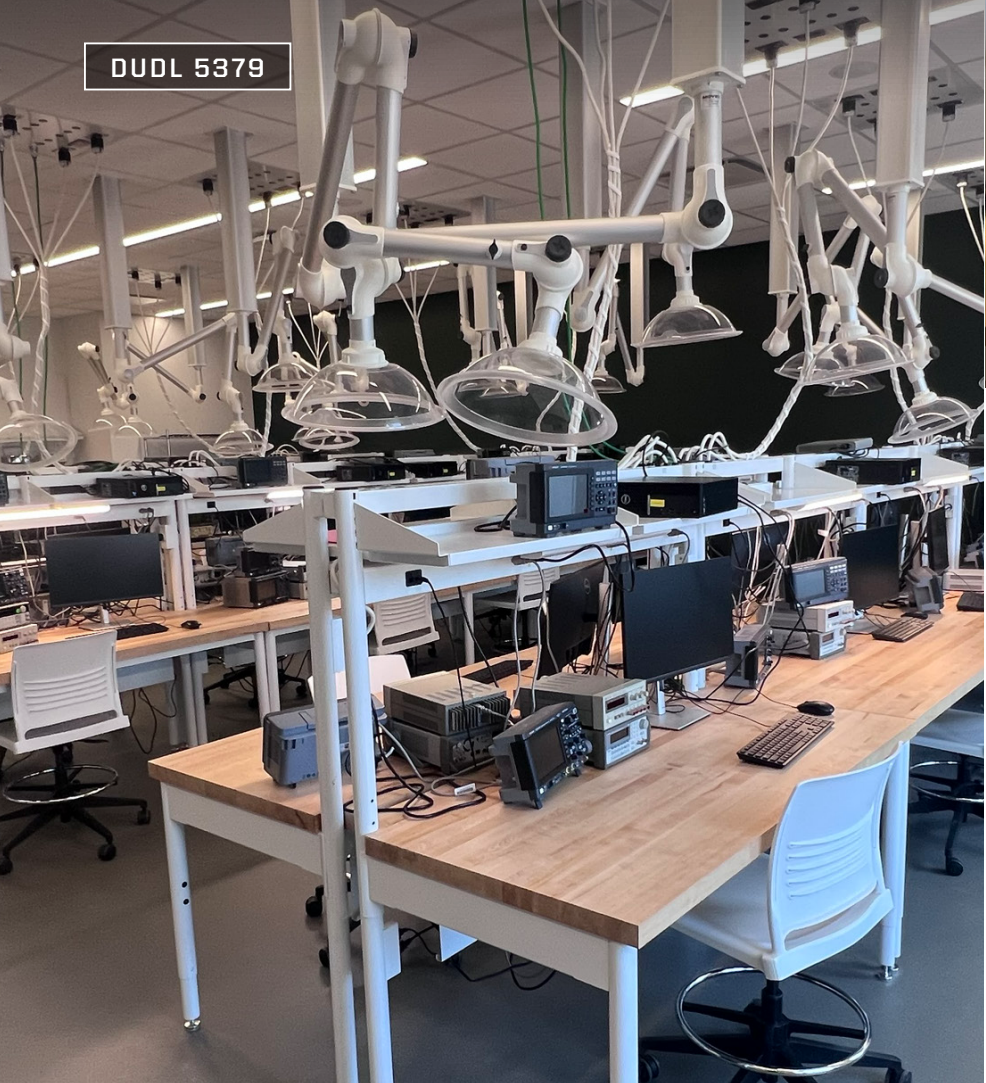
Recognized as one of the premier fluid power teaching facilities in the nation, Purdue's Fluid Power Laboratory offers an unparalleled hands-on learning experience in hydraulics, pneumatics, and motion control systems. Spanning 2,500 square feet, the lab combines a modern classroom setting with advanced equipment, creating an ideal environment for education and research.

Students develop practical skills through interactive training in fluid power components, circuits, testing, and troubleshooting. Cutting-edge hydraulic and pneumatic workstations, paired with state-of-the-art electronic instrumentation and computer simulation tools, provide real-world experience in designing, analyzing, and improving systems.

The lab supports multiple courses across fluid power and automation disciplines and fosters groundbreaking research, including innovative hydraulic valve flow force compensation. Generous contributions from industry leaders like Bosch Rexroth, Parker Hannifin, and Eaton Corp. further enhance its capabilities, ensuring students are industry-ready from day one.

ADVANCED ELECTRONICS LAB

DUDL 5379





The Electronics and Communications Laboratory equips students with professional-grade instrumentation and facilities to design, build, and evaluate advanced electronic systems. Students explore consumer power systems, using microcontrollers to drive switching and analog power electronics for applications like motors, loudspeakers, and light displays up to $\frac{1}{2}$ kilowatt. Precision-focused projects refine analog and audio systems, achieving full-power error and distortion rates below 0.2%.

The lab also supports high-frequency electronics and communication courses, offering state-of-the-art tools such as spectrum analyzers, RF signal generators, and vector network analyzers capable of testing circuits up to 6 GHz. A dedicated RF anechoic chamber ensures accurate testing by shielding external RF energy, making it ideal for sensitive circuit analysis and antenna testing.



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School of Engineering Technology