

25 Years of Design Day

Dec. 6, 2018

MSU Engineering will celebrate 25 years of Design Day Friday, Dec. 7

The Michigan State University College of Engineering will celebrate a quarter-century of student creativity and innovation on Friday, Dec. 7, during "25 Years of Design Day" – an event that has become the showcase of technical



skill, experiential learning, and collaboration each semester.

"Design Day in the MSU College of Engineering has evolved from a couple of mechanical engineering courses to the premier undergraduate event of the semester," said Design Day Executive Director Wayne Dyksen, who is also a professor of computer science and engineering. "It is a great event for students to exhibit the creative energy and talents that will one day shape business, industry, and our communities."

Fall Design Day runs from 8 a.m. to noon in the Engineering Building, 428 S. Shaw Lane, East Lansing, with awards presented at 1:15 p.m. in Anthony Hall Room 1281. Design Day is free and open to the public.

Dyksen said the College of Engineering makes sure that design experiences are built into the curriculum for all students.

"From the first day our students arrive on campus until the day they walk across the stage at graduation – design is embedded into everything a Spartan Engineering student does here at MSU," Dyksen continued. "Design Day helps us show off what we do and how we do it."

This fall's Design Day incorporates projects from six degree programs and seven courses involving 440 students on 93 teams. The 15-week capstone course, which is required for graduation, provides a platform for students to apply the knowledge and experience gained throughout their engineering education at MSU, Dyksen explained. Working in teams of four or five, seniors put their best efforts into solving real-world problems for big and small companies and present their products at Design Day.

Some of the projects include:

MSU Recycling – Automated Waste Detection

Managing waste from MSU's large campus is no small feat. MSU maintains 200 outdoor waste bins (800 bins during football season). Checking the status of the 200 bins is labor intensive and is performed twice weekly by a two-person crew, driving a route to each of the 200 bins. Manual inspections show that around 70 percent of the time, the



bins are only half full and do not need emptying. The unnecessary stops result in increased labor and material costs, and additional carbon emissions. So capstone teams from mechanical engineering and electrical and computer engineering developed an automated monitoring system to increase the efficiency of this waste management process. The result is a durable and weatherproof packaged sensor system that can be easily integrated into existing bins. The sensors detect the bin level and communicate with MSU Recycling's existing software. The solution helps MSU Recycling monitor bins remotely and plan waste collection routes accordingly.

NASA/Arizona State University Neutral Flux Probe

One of the capstone projects this semester ties Spartan Engineers to NASA's Psyche project – which will send a spacecraft to a metal-rich asteroid currently orbiting between Mars and Jupiter. Five mechanical engineering and three electrical engineering students from MSU, working with a team at Arizona State University, collaborated on solar-electric Hall Effect Thrusters to design a probe capable of measuring the flux of neutrals inside vacuum test facilities. As the neutrals exit the plume of the thruster, it will cautiously move the probe on the asteroid. NASA will launch the spacecraft in 2022 and anticipates it will reach the asteroid in 2026.

Aptiv – Autonomous Vehicle Fleet Connectivity App

Computer science and engineering (CSE) students Alex Patton, Drew Glapa, Emilio Castillo, Klint Kaercher, and Chad Krause worked with Aptiv on an autonomous vehicle fleet connectivity app providing connectivity to Aptiv's autonomous test fleet in the U.S., Europe, and Asia. The app tells Aptiv where their cars are across several continents, who is driving them, and offers options for scheduling and availability. The app also displays a complete set of usage, reservation, and diagnostic information.



Meijer – Shrink Reduction Using Blockchain

CSE students Lucas Banks, Moritz Greiss, Mohammad Yousafzai, Phillip Litchfield, and Matt Wilimberg helped Meijer reduce product expiration for items like produce and dairy by creating a web app called Shrink Reduction Using Blockchain. The app helps Meijer by tracking products along the entire supply chain, from supplier to store. Shrink reduction alerts help Meijer decide which products should be put on shelves based on expiration dates. As a result, more products are sold before their expiration dates, thereby reducing shrink.

Michigan State University – Water Treatment and Storage

Seven teams in civil and environmental engineering (CEE) participated in CE 495 senior design, preparing a preliminary design for MSU's pSU's proposed massive improvement to the campus water distribution system. Students explored the construction of a new water treatment plant and an elevated 2-million gallon water tower, being built south of Service Drive. Completion of the \$18 million project is planned for spring 2020.

Herman Miller – FIBRE: Fabric Identification Based Recommendation Engine

CSE students Ted Stacy, Ritwik Biswas, Joe Smith, David Xuan, and Josh Bhattarai helped office and home furniture company Herman Miller with the creation of FIBRE: Fabric Identification Based Recommendation Engine. Using computer vision and machine learning, FIBRE classifies fabrics, automatically detecting color and pattern and eliminating the current process of manually searching existing catalog of fabrics, which is tedious, error prone and time-consuming. FIBRE reduces the number of fabric options from thousands to a few by detecting color and patterns.

Fall 2018 Design Day by the numbers

- 440 students
- 93 teams

Capstone projects represent:

- 317 students
- 54 teams
- 40 Michigan-based companies and institutions (77 percent)

Pre-college outreach programming includes:

- 3 high schools, plus Women in Engineering
- 146 students in grades 9th-12th
- 17 teachers

Design Day Awards Ceremony: 1:15 p.m., Anthony Hall Room 1281

- 10 awards conferred to top Design Day teams
- Judges include faculty and corporate representatives

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Background on Design Day

- Six undergraduate degree programs represented this fall: Civil and Environmental Engineering, Computer Science and Engineering, Electrical and Computer Engineering, and Mechanical Engineering
- Twice yearly event on last day of each semester (before finals week)
- 25th Year for Design Day (initiated in 1994 by the Department of Mechanical Engineering)

See the team members and their projects in the [Fall 2018 Design Day project booklet](#). Read more on [Design Day at MSU Engineering](#).

For more information, contact Wayne Dyksen (dyksen@msu.edu) or Jill Bielawski (bielawsk@msu.edu).

Related Website: [Communications contact: Patricia Mroczek](#)

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