

STUDENT OVERVIEW

The Center for Design and Manufacturing Excellence (CDME) is the manufacturing port of entry into Ohio State. With a dedicated staff of product engineers and participation by research faculty, CDME is able to move at the speed of industry while continuing to innovate. The leadership of CDME are all former industry business leaders who successfully commercialized federal research.

Industry has indicated to Ohio State that workforce development is one of the main drivers of university engagement. As such, CDME was designed to be a results-driven industry center that provides a platform for experiential learning.

CDME employs a growing cadre of undergraduate and graduate students across the spectrum of majors. These students bring different focus areas and passions to projects executed by CDME. The cross section currently includes students from multiple engineering disciplines, business and finance, visual communications, marketing and industrial design. CDME works to ensure they get out to customer sites and see what engineering and manufacturing actually looks like. CDME strives to ensure that students learn the business of manufacturing. This includes:

- **Business Analysis and Development** – Students at CDME learn how to identify and develop new business opportunities for CDME and its member companies.
- **Industrial Design** – Students are involved in ideation and creation sessions with customers, which lead to novel solutions for industry.
- **Project Scope and Definition** – Students learn how to effectively define and scope projects. An understanding of performance based milestones is introduced very early.
- **Project Management** – Once a project has been funded, students are actively involved with the management of the project. PMP principles are taught and utilized.
- **Product Lifecycle** – Students work with industry partners to ensure that technology insertion and product development follow existing lifecycle plans.
- **Business Analysis** – Students participate in programs such as ICorps@Ohio, business plan competitions, entrepreneurship programs and other initiatives where they learn how to create intelligible business analysis.
- **Partner and Supply Chain** – Collaboration is a cornerstone of CDME, and students actively participate in projects that involve multiple partners from a manufacturing supply chain or from non-competitive industries. Students learn how to identify and manage partner relationships.
- **Prototyping** – Students create CAD and/or software prototypes of industrial design projects.



PHOTOS

1. Students tour Dynalab in Reynoldsburg, Ohio.
2. Learning the casting process at Columbus Castings.
3. Students learning business model canvas at I-Corps@Ohio.
4. Learning manufacturing process at Clyde Whirlpool Factory.

CASE STUDY

Circular Wave Drive (CWD) – A faculty member at Ohio State, with a distinguished career in robotics, conceived a novel gearing system to replace harmonic wave drives in humanoid robotics. This conceptual design was promptly protected with a provisional patent. Students performed a market analysis and identified several other industrial verticals where the gear was applicable with slight modifications. The conceptual gear was then analyzed by the students working with a CDME engineer. A new gear designed to be an improvement on the conceptual was prototyped, tested and patented (with a CDME undergraduate student as an inventor). A start-up licensed the technology and requested student interns to test various gearing concepts. Students participated in the development of a proposal to seek additional technology validation capital which resulted in a \$600,000+ project to develop a series of manufacture-ready prototypes. Engineering students are now working with manufacture partners to determine functionality of the CWD in multiple industrial applications. Business and visual communications students are developing a targeted marketing and outreach plan.

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