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Minnesota Educators Bring Semiconductor and Microelectronics Learning into the Classroom

New pilot connects educators with industry and higher education partners to prepare students for careers across Minnesota's technology workforce

ST. PAUL, Minn. — September 9, 2026 — Seven Minnesota educators spent August 3–7 immersed in semiconductor and microelectronics technology through a new pilot initiative designed to bring emerging technology, industry expertise, and career-connected learning into Minnesota classrooms.

Organized by the **Minnesota State Engineering & Applied Manufacturing Center of Excellence**, with support from **Seagate, Polar Semiconductor, and the Minnesota Nano Center**, the **Microelectronics Mini-Externship & Curriculum Training** combined hands-on, industry-informed learning with direct exposure to Minnesota industries using semiconductor and microelectronics technologies. Participating K–12 educators received a stipend to support their participation and continued professional learning.

The initiative was funded through a **Minnesota STEM Ecosystem Partnership Grant**. The **Minnesota State Energy Center of Excellence** also partnered with the Engineering & Applied Manufacturing Center of Excellence to help facilitate administrative activities supporting the program.

"This is exactly the type of connection we want to create between Minnesota classrooms and Minnesota's workforce," said Emily Saed, Director of the Minnesota STEM Ecosystem. "Students cannot pursue careers they don't know exist. By giving educators direct exposure to the technology, workplaces, and people across Minnesota industries that rely on microelectronics, we're helping them bring those career possibilities back to their students."

From Industry to the Classroom

During four days of hands-on training in Bloomington, educators explored circuit design, transistors, semiconductor concepts, logic, memory, and digital systems through classroom-ready activities and applied learning experiences.

Minnesota is one of two states invited to pilot the developing curriculum and the only state pairing the curriculum with educator industry externships. Participating educators can select concepts and learning experiences appropriate for their students, from introductory exploration of resistors, circuits, and electronic components to more advanced semiconductor and digital systems applications. Educators are not expected to use every part of the curriculum, allowing them to adapt the learning to the readiness, interests, and needs of their students.

Industry expertise was integrated throughout the experience, helping educators connect technical concepts with workplace applications, career pathways, equipment, processes, and problem-solving approaches used in the field.

An Automation Robotics Engineering Technologies instructor from **Hennepin Technical College** also shared how the college worked with industry partners to develop training aligned with maintenance technician workforce needs, providing educators with an example of how postsecondary education and industry can collaborate to build technical career pathways.

On the final day, participants continued their learning at the **Minnesota Nano Center at the University of Minnesota**, where they explored semiconductor research, fabrication technologies, microelectronics applications, and related technician, engineering, research, and advanced manufacturing careers.

“The goal is not simply to teach educators about semiconductors,” said Jason Bruns, Director of the Minnesota State Engineering & Applied Manufacturing Center of Excellence. “We want educators to understand the technology well enough to help students explore it, ask questions, solve problems, and begin seeing themselves in the careers connected to this rapidly evolving industry.”

Supporting Classroom Implementation

The professional development extends beyond the weeklong training. Participating educators also completed two-day industry mini-externships, including placements with Polar Semiconductor and other industry partners. These experiences provide firsthand exposure to workplace technologies, technical occupations, career pathways, and employer expectations that educators can translate into classroom examples, projects, and career exploration opportunities.

Grant funding helped outfit participating classrooms with the supplies, materials, and microelectronics equipment needed to begin implementing these learning experiences with students. Participants were also provided access to the developing, industry-informed pilot curriculum and supporting instructional resources.

Together, K–12 educator stipends, access to the pilot curriculum, classroom equipment, instructional resources, and professional learning were designed to reduce common barriers to introducing new technical content and minimize the additional investment needed to bring microelectronics learning into classrooms.

Educators will continue meeting as a cohort throughout the academic year to share classroom experiences, compare instructional approaches, troubleshoot implementation challenges, and provide feedback that will help refine the curriculum. This ongoing peer learning and support is an intentional part of the program model, extending the experience beyond a one-time professional development event.

Educators Helping Shape the Pilot

The eight participating educators represent K–12 and postsecondary settings across Minnesota, including:

- Career Pathways Charter School
- Glencoe-Silver Lake Public Schools
- Minneapolis Public Schools
- Moorhead Area Public Schools
- Saint Paul College
- Saint Paul Public Schools
- Wayzata High School

Because the curriculum is still being developed, participating educators are helping shape future versions by identifying where additional explanations, classroom supports, equipment, activities, and instructional resources are needed for different student populations and learning levels.

Connecting Students to Minnesota's Technology Workforce

Microelectronics technologies are used across a wide range of Minnesota industries, including semiconductor manufacturing, medical technology, advanced manufacturing, automation, computing, and other technology-driven sectors. The foundational skills introduced through the pilot can therefore connect students to career opportunities well beyond semiconductor manufacturing alone.

Career opportunities connected to these technologies range from production and equipment operation to maintenance, automation, engineering, research, and other technical occupations requiring different levels of education and training.

The pilot helps educators connect foundational electronics and microelectronics concepts with real-world applications, education pathways, and careers across these industries. By providing industry-informed learning, classroom resources, and continued support, the initiative is designed to help more Minnesota students explore where microelectronics is used and the range of careers connected to it.

The initiative reflects a broader effort to strengthen connections among Minnesota educators, colleges and universities, industry, and workforce partners while bringing industry-informed microelectronics learning and career exploration to more Minnesota students.

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About the Minnesota State Engineering & Applied Manufacturing Center of Excellence

The **Minnesota State Engineering & Applied Manufacturing Center of Excellence** is part of the **Minnesota State Colleges and Universities system** and serves as a statewide resource connecting students, educators, employers, and Minnesota State colleges and universities with opportunities in engineering and applied manufacturing. The Center supports career exploration, educator and student engagement, workforce partnerships, and initiatives that strengthen Minnesota's engineering and manufacturing talent pipeline.

About the Minnesota STEM Ecosystem

The **Minnesota STEM Ecosystem** brings together industry, K–12 education, higher education, and out-of-school STEM learning programs to align formal and informal STEM education with workforce needs,

expand access to high-quality programming, and drive innovation and workforce development through regional and statewide collaboration.

As part of a historic investment from the Minnesota Legislature, the **Minnesota STEM Ecosystem Partnership Grant Program** is designed to expand access to high-quality STEM learning experiences and workforce development opportunities in emerging technologies and in-demand career pathways.

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