



In addition to its status as an NSF Industry/University Cooperative Research Center, the Center for Precision Metrology and Charlotte's Center for Optoelectronics and Optical Communications received a planning grant in 2023 from the U.S. Department of Commerce's Economic Development Administration. The investment will drive regional innovation and job creation by strengthening capacities behind manufacturing technology that will advance U.S. competitiveness.



MEASURED EXCELLENCE

UNC Charlotte leads the way in manufacturing innovation

Air travel safety. Vehicle fuel efficiency. Cell phone reliability. They all hinge on the precision of manufacturing measurements. Particularly when minute deviations from fabrication specifications – often smaller than 1/1,000 the width of a strand of hair – can result in disaster.

UNC Charlotte's Center for Precision Metrology is a global leader in shaping the future of manufacturing. As the western hemisphere's premier and exclusive source of academic and research excellence in the field since 1997, CPM is dedicated solely to advancing the science of precision measurement.

With state-of-the-art equipment, world-class research talent, support from key federal agencies and strong industry partnerships, CPM is developing scientists and engineers with the skills to ensure the safety and viability of future manufacturing.

MEETING INDUSTRY & GOVERNMENT NEEDS

Housed within the William States Lee College of Engineering, CPM offers expertise available nowhere else. While some technical school metrology programs are equipped to train students in the

use of specialized equipment, Charlotte — through its focused Ph.D. program — provides a combination of hands-on lab opportunities and exposure to cutting-edge tools that delivers a distinctive competitive edge for graduates and superior talent for employers.

"New metrology needs arise with every manufacturing process that is developed," said Ed Morse, CPM's director. "UNC Charlotte is uniquely prepared to address industry updates as they occur."

From their CPM experience, graduates forge successful careers in academia and with manufacturing companies such as Caterpillar, Boeing, Cummins and Intel and national labs like Lawrence Livermore, Los Alamos and Oak Ridge.

"My degree was pivotal in getting me to the next level in my career," said Mario Valdez '15 Ph.D., who is an R&D engineer in weapons digital engineering strategy for Los Alamos National Labs. "I was able to go from an entry-level, metrology engineer to subject matter expert in precision metrology for the weapons production directorate. After completing my studies at CPM, I had a sense of 'I can actually make a difference.'"

INDUSTRY LEADERS AGREE

CPM's corporate affiliates, which support the center financially through their membership, meet semiannually with CPM faculty and students, who present groundbreaking research designed to solve real-world challenges. Every student forms close relationships with these potential future employers; their involvement is regarded by the companies as a value-added benefit.

For example, Cummins, a global power technology leader specializing in diesel and alternative fuel engines and generators, has hired more than a dozen Charlotte graduates in recent years.

"Quality is the cornerstone of manufacturing and quality engineering has a place across the entire product life cycle," said Steven Stahley, the company's director of measurement excellence. "Cummins has gained significant value from access to CPM students and staff whose technical expertise has helped to solve some complex measurement science problems."

Similarly, California-based Intel, which has a presence in the Carolinas, has partnered with CPM to test new technologies in campus labs before proliferating them globally.

"CPM has the technical depth to support evaluation and qualification of new technologies and techniques," said Martin Osborne, an Intel principal engineer and director.

A Charlotte alumnus who earned both a master's

degree and a Ph.D. in mechanical engineering, Osborne appreciates the availability of an undergraduate concentration in metrology within the Department of Mechanical Engineering. "Undergrads who focus on metrology will be valuable to manufacturing spaces," he said. "Their understanding of dimensional tolerances and interaction with equipment performance can help resolve exclusionary events quickly in a well-structured and data-driven way."

Morse emphasizes that the curriculum for the new academic concentration is based on feedback from CPM's industry partners. "Many companies want to hire someone in metrology but don't necessarily need a scientist," he said. "They want an engineer who has been exposed to metrology and will have a head start doing the work."

To learn more, visit cpm.charlotte.edu.

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