

Optics Manufacturing Technician Apprenticeships

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Abstract: The booming optics manufacturing industry is suffering from a severe shortage of skilled technicians. The registered Optics Manufacturing Technician apprenticeship is a structured “earn and learn” solution that combines on-the-job learning with related technical instruction. © 2021 The Author(s)

The Optics, Photonics and Imaging industry is responsible for remarkable innovations that have revolutionized our world—and improve our lives, every single day. Smartphones, back-up cameras, barcode scanners, QR codes, VR glasses, night vision goggles, solar panels, Netflix, and autonomous vehicles...to name only a few. The industry is growing at an exponential rate and is suffering from a worldwide shortage of skilled optics technicians. Our lack of Optics and Photonics technicians is a national security threat. Without Optical technicians we cannot safeguard our country nor continue to innovate.

Since the founding days of Kodak, Xerox, and Bausch + Lomb, Rochester, New York has been known across the country and around the world as a center for optics research, invention, and manufacturing. Rochester’s optics manufacturers rely heavily on three local educational institutions to provide them with a constant supply of optics engineers, technicians and designers: University of Rochester, Rochester Institute of Technology, and Monroe Community College (MCC). MCC has a long history of educating technicians for the workforce through its highly recognized Optical Systems Technology A.A.S. degree program. The graduates of this program have often gone on to become leaders in the optics industry. Yet, MCC is the only college in the world awarding associate degrees in precision optics.

For several decades, our society and education system have emphasized the value of a 4-year college education at the expense of workforce education, and our nation is suffering because of it. MCC and other community and technical colleges have been proving that satisfying and rewarding careers are available to completers of training, certificate, and associate degree programs. Unlike trades in many industries, such as HVAC, construction, welding, automotive, electrical, and plumbing that train technicians through apprenticeships and trade schools, most optics companies train technicians in-house, and that’s a lot of work.

In 2006, MCC received funding from a WIRED grant to launch a “new” training program for optics technicians. The resulting Precision Optics Manufacturing Technician (POMT) apprenticeship program was designed by MCC and Optimax Systems to provide a structured learning method for producing highly-skilled optics Technicians. Building upon this early work, the Optical Systems Technology program at MCC received a \$550,000 grant from the National Science Foundation and a \$4.4 million grant from the Department of Defense in support of technician training. The vision of MCC’s \$4.4 million grant from the Office of Naval Research is to strengthen and expand the national precision optics workforce to ensure technological superiority for the DOD, by expanding the apprenticeship program both locally and nationally.

Apprenticeships offer a proven learning method that benefits both the employer and employee. The employer benefits with a more stable workforce, improved attendance, productivity and quality, while the employee earns long-term career opportunities, workplace relevant skills, and industry recognized credentials. In many cases the apprentices also receive an academic certificate or degree.

Apprenticeships are either governed by individual states or by the US Department of Labor (DOL). This varies state by state. Some states run state-based apprenticeship programs and other states run USDOL-based apprenticeship programs. Each worker’s employer provides the on-job-training. The worker receives direction and guidance from experienced opticians and/or supervisors. Each skill set has a minimum competency level and the worker will rotate through the company’s various manufacturing processes to gain the required skill level. Their work is periodically evaluated against a set of employer standards that includes quality, quantity, attitude, and aptitude.

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The approved New York State Precision Optic Manufacturing Technician (POMT) apprenticeship is a time-based program mirroring traditional apprentice structures which have been proven effective in developing technician-level workers. This program takes a minimum of three (3) years to complete with 2,000 hours per year of on-the-job training and 144 hours per year of Related Technical Instruction (RTI) required. Successful apprentices have the opportunity to continue towards the formal A.A.S. degree after completing this program. Presently there are four registered POMT sponsoring companies in the State of New York.

The USDOL approved Optics Manufacturing Technician (OMT) apprenticeship program is a competency-based program, and has the same 144 hours per year requirements for Related Technical Instruction. In 2021, MCC helped establish the first USDOL-approved Optics Manufacturing Technician apprenticeship in partnership with LaCroix Precision Optics.

In order to expand the apprenticeship nationally, the Related Technical Instruction had to be delivered differently. One of MCC's Optical Systems Technology's innovative training approaches has been to develop online courses. With online courses, we are able to train technicians outside of the Rochester, NY area. This is significant for the development of our optics manufacturing apprenticeship program. Prior to the development of our MCC online courses, there was not sufficient related technical instruction for an optics manufacturing apprenticeship.

The US DOL has acknowledged the need to expand apprenticeships across the country to secure our future growth. The Biden Administration plans to expand registered apprenticeships through: Amending the National Apprenticeship Act with \$3.5 billion in new spending over the next five years, invest \$50 billion into workforce training by creating partnerships among community colleges; businesses; unions; universities and high schools; and state, local and tribal governments, and reinstate the National Advisory Committee on Apprenticeships.

There are numerous state and federal apprenticeship grant funding that will cover the cost of the related technical instruction. Many states also provide tax credits for having an apprenticeship program.

This new "structured apprenticeship" has evolved into a long-term solution that will allow Optics manufacturers to grow their workforce to meet their future production growth. This new apprenticeship will incorporate the newer technologies and processes that reflect today's modern optics/photonics enterprises and training delivery systems.