

Stonehill College Easton, Massachusetts

LASER-TEC is the Center for Laser and Fiber Optics Education, founded in 2013 by the National Science Foundation (NSF), and headquartered at Indian River State College in Florida. It was founded to help meet the goals of educating and sourcing domestic talent in the areas of optics and photonics. As a service to students, recent graduates, and prospective employers, Photonics Spectra will run profiles of some of the 36 LASER-TEC colleges throughout 2020.

Stonehill College offers three photonics programs: A bachelor's degree, a minor, and a 15-month technician's Certificate in Advanced Manufacturing & Integrated Photonics Program. The certificate program is offered in collaboration with Bridgewater State University (BSU) and AIM Photonics Academy. It features hands-on training with modern equipment, a two-day boot camp at MIT, a capstone experience, and an internship—all designed to rapidly prepare students for immediate employment upon completion. Companies offering internships and employment opportunities include: Sheau-mann Laser, MKS Instruments, Analog Photonics, Northrop Grumman, IPG Photonics, BAE Systems, Instron, IQE, AccuRounds, MIT Lincoln Labs, Forward Photonics, Applied NanoFemto Technologies, Plymouth Grating Laboratory, and AFL Global.

Programs

Bachelor's Degree in Photonics

This four-year, interdisciplinary program emphasizes a strong science foundation with hands-on practice on state-of-the-art equipment used in industry. Students complete basic and applied coursework in optics, quantum mechan-



Professor Cheryl Schnitzer and Andrew Fitzgerald (Class of 2021) align a KM Labs Ti:sapphire laser.

ics, lasers, interferometers, photonics, optical fibers, semiconductor materials and devices, integrated photonics, and waveguides. Students design photonic integrated circuits (PICs), which may be sent to the SUNY Polytechnic Institute cleanroom for fabrication. Graduates with this degree will be well positioned to enter a variety of graduate programs, including the optics M.S. program at the University of Rochester's Institute of Optics, with which Stonehill has a co-operative agreement.

Advanced Manufacturing & Integrated Photonics Certificate

The certificate offers:

- Collaboration with BSU and AIM Photonics Academy.
- Backing by the U.S. Office of Naval Research.
- Part-time, 15-month duration, beginning each May.
- Free, open access to all course material online.

Program courses include:

- Introduction to Advanced Manufacturing and Photonics
- Electricity and Electronics for Photonics and Optical Technicians
- Tools and Testing Equipment
- Tools and Materials for Advanced Manufacturing and Photonics
- Digital Fundamentals
- Statistical Process Control in Photonics and Automation
- Introduction to Optics for Photonics and Optical Technicians
- Introduction to Fiber Optics for Photonics and Optical Technicians
- Photonic Integrated Circuits
- Photonics Capstone
- Photonics Internship

Graduates of the certificate program will have the skills to:

- Follow written instructions for manufacturing, troubleshooting, and safety.
- Use basic electronics tools, follow

LASER-TEC college profile

electronics safety protocols, and compute basic electronics values.

- Describe and perform process and control principles for advanced manufacturing techniques.
- Use advanced electronics devices such as oscilloscopes, soldering equipment, and DC and RF probes.
- Understand the principles of semiconductor manufacturing.
- Align a laser system and characterize beam modes using modern optical testing equipment.
- Couple fibers in free space and on PICs.
- Describe the theory behind design and fabrication of integrated circuits.
- Independently troubleshoot equipment.
- Use a variety of precision measurement tools to create and test solutions within photonics.
- Use mathematics as related to machine shop needs.
- Explain cleanroom uses and protocols.

- Troubleshoot basic electronic circuits and wirings.
- Perform basic CNC (computer numerical control) machining and state-relevant safety protocols.
- Explain basic chemical safety in common manufacturing situations.
- Write technical notes for manufacturing or repair, and follow instructions and safety guidelines.
- Troubleshoot and repair mechanical systems.
- Identify and provide correct safety information on common lasers used in photonics.
- Use modern equipment to handle fiber and characterize losses through fibers.
- Use a probe station to test and characterize PIC performance.
- Work within a manufacturing or other industry workplace with appropriate interpersonal and teamwork skills.
- Communicate design choices to photonics professionals.

How to recruit from this college

Come to our college to present your company and employment opportunities to our students. We will make available, free of charge, a private room to interview interested students. Contact Kristine Shatas to make arrangements for a recruiting visit. Interns and graduates are available every summer.

Contact information

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kshatas@stonehill.edu
Career Development Center
320 Washington Street
Easton, MA 02357

Program websites

www.stonehill.edu/programs/photonics
www.stonehill.edu/programs/photonics-certificate



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OSA Laser Congress and Exhibition
12 – 16 October 2020
Québec City Convention Centre
Québec City, Québec, Canada

osa.org/LaserOPC

OSA TOPICAL MEETINGS
Advanced Solid State Lasers Conference
Laser Applications Conference

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This meeting will be held as scheduled.
OSA continues to monitor advisories related to COVID-19, and commits to being responsive amidst changing conditions to facilitate maximum participation for speakers and attendees while ensuring the well-being of all participants.