Niagara College
Ontario, Canada

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 established 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 runs a profile of one of the 35 LASER-TEC colleges each month.


Niagara College students work in the photonics cleanroom.

Since 2001, Niagara College has maintained a cluster of photonics programs with training in precision optics, thin-film deposition, fiber optics, and electro-optic technologies. Graduates of the program are employed in a wide range of industries, including defense, aerospace, biomedical, communications, heavy industrial, and entertainment. Celebrating 20 years of training students in photonics, the college has undertaken a renewal of its facilities and program curriculum. The renewal initiative includes establishing a dedicated precision optics lab facility for optical manufacturing and lens testing, expanding the current thin-film deposition curriculum, and improving capabilities to train students in optical system testing and alignment.

Programs

Photonics Engineering Technician
(2-year diploma)
Photonics Engineering Technology
(3-year advanced diploma)

The Photonics Department currently provides a laddered program offering students an exit point with a Photonics Engineering Technician Diploma obtained after two years, or they can receive a Photonics Engineering Technology Advanced Diploma after three years. Students train in a dedicated teaching cleanroom, a Class 4 laser lab, a spectroscopy lab, a manufacturing space, and a photonics flex-lab facility to emulate the advanced manufacturing industry environments that graduates will transition into.

Graduates of Niagara College's Photonics Engineering programs have skills in:

- Thin-film deposition.
- Testing and aligning lasers.
- Aligning optical systems.
- Optical testing.
- Cleaning and maintaining precision optics.
- Fiber optics preparation, including fusion and mechanical splicing, and testing OTDRs (optical time-domain reflectometers), OSAs (optical spectrum analyzers), and OPMs (optical power meters).
- Electronics test instrumentation.
- SMT (surface mount technology) and through-hole soldering.
- 2D and 3D modeling and additive manufacturing.
- Introductory laser welding and cutting.
- Introductory optical manufacturing.
- Introductory optical design (technologists).
- Applied research (technologists complete an 8-month capstone project).

How to recruit from this college

Contact Alexander McGlashan to make arrangements for a recruiting visit. Graduates are available at the start of each May, although it is recommended to recruit early because graduates are in short supply.

Contact information

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Program website

www.niagaracollege.ca/technology


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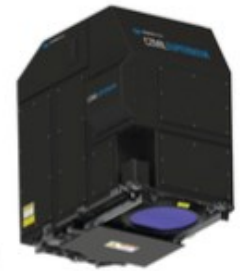
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1 Femtosecond Laser

The ORIGAMI XP v5.0 femtosecond laser from **NKT Photonics Inc.** is equipped with internal sensors to monitor and log critical operational laser parameters. The ORIGAMI 10XP version 5.0 is available as a 4-W laser with a 40-µJ maximum pulse energy, while the ORIGAMI XP5 delivers 5-W power and maximum pulse energy of 70 µJ. The ORIGAMI XP v5.0 has a pulse width control option allowing for pulse width tuning from <370 fs to 5 ps. Stability of the average power is kept to <1% rms over 100 hours, due to closed-loop power control.
sales@nktphotonics.com

2 Terahertz Spectrometer

The C16356 Handy Probe Terahertz Spectrometer from **Hamamatsu Photonics KK** features a separate, hand-held probe head connected to the main unit by an optical fiber to enable the measurement of large samples, solids, and living organisms. Compared to conventional benchtop products, the C16356 is more compact, lightweight, and highly vibration-resistant for mobility on production sites, making it a versatile tool for the quality control of medicines, chemicals, and food.
photonics@hamamatsu.com

3 Holographic Gratings

Volume phase holographic (VPH) gratings from **Thorlabs Inc.** are manufactured in-house and provide high first-order diffraction efficiencies across broad bandwidths, and low polarization dependence loss. The gratings consist of a gelatin film with periodic index modulations sealed between AR-coated glass substrates, providing low scatter of stray light and minimal ghosting. Customized round or square optics can be achieved in dimensions between 10 and 60 mm. Current offerings include 50- × 30- × 6-mm VPH gratings with 800, 900, 1000, or 1200 lines/mm, but high dispersion can be achieved with custom line densities from 400 to 1600 lines/mm, design wavelengths from 300 to 2000 nm, and bandwidths of 20 to 500 nm.
sales@thorlabs.com

4 Moisture Meter/Thermal Imager

The MR265 Moisture Meter and Thermal Imager from **Teledyne FLIR** quickly identifies and locates water leaks and other moisture issues at the source. This dual thermal imager and measurement tool combines a 160- × 120-resolution Lepton thermal camera, a visual camera, a laser pointer, and both pin and pinless moisture detection for faster leak identification and measurement, with easy reporting through the FLIR Thermal Studio Suite. The device embosses edge detail from a 2-MP visible camera onto the thermal image via MSX, providing the user with more detail and context on screen and in saved images.
sales@flir.com

5 Battery Cleaning Laser Machine

The Battery Cleaning Machine turnkey system from **Laserax** is made specifically to clean battery modules on conveyor lines for electric vehicles (EVs). The device can be powered by up to 500 W of laser power to minimize cycle time when preparing surfaces for welding. It also offers high cleaning quality assisted by cameras. The laser process and optical configurations were developed to address safety concerns specific to the EV industry, where high heat levels could lead to accidents or cause serious damage. While the laser process minimizes heat dispersion, the optical components are monitored and automatically shut down if they do not behave as they should. To meet the evolving needs of battery manufacturers, the machine includes a flexible door system that can load modules in different ways.
sales@laserax.com

6 Geospatial Bathymetric Lidar

The CZMIL SuperNova geospatial bathymetric lidar solution announced by **Teledyne Optech** and **Teledyne CARIS** provides excellent depth penetration and high green laser point density through SmartSpacing technology. The device provides even and efficient point spacing, real-time processing capability for reduced post-processing time, and configurable modes for maximizing performance in different water environments. The SuperNova provides a wide range of inputs for climate change modeling and it is ideal for inland water environments and base mapping for coastal zones and shorelines. BASE Editor software is provided for seamless data processing capacity. Leveraging artificial intelligence techniques for land/water discrimination and noise classification, the solution increases efficiency in the processing workflow.
vau_inquiries@teledyneoptech.com