

Gallatin College, Montana State University Bozeman, Montana

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 LASER-TEC colleges each month.

The state of Montana encompasses one of the densest per capita clusters of optics and photonics institutions in the U.S. To meet the ever-growing workforce demands of this industry, Gallatin College offers an Associate of Applied Science (AAS) degree in photonics and laser technology (PLT) to develop highly trained photonics and electro-optics technicians.

Located in Bozeman, Mont., the college complements four-year programs at Montana State University (MSU) and ensures access to workforce development that promotes a vibrant local economy. Since its inception in the autumn of 2016, the PLT program has graduated approximately 40 technicians. Numerous companies from the Gallatin Valley regional photonics cluster have hired and continue to hire graduates from the program as the local industry has experienced rapid growth in recent years. Companies employing Gallatin College PLT graduates include Lumibird, Aurora, AdvR Inc., Quantum Composers, Bridger Photonics, Lattice Materials, and others.

Program description

Students completing Gallatin College MSU's AAS program in PLT will



A student characterizing the properties of a polarizing beamsplitter.

understand the scientific principles of electronics, photonics, and advanced manufacturing. This includes a focus on the fundamentals of light, geometric and physical optics, laser systems and their associated applications, and advanced manufacturing techniques. Graduates will also have a foundational understanding of AC and DC circuits, and the fundamentals of solid-state devices and digital electronics.

Gallatin College MSU's PLT program prepares students to become technicians in photonics and electro-optics who are capable of working on products or devices used in manufacturing, communications, defense, homeland security, the medical industry, information technology, energy, environmental monitoring, lighting, displays, and entertainment. A large portion of the electronics and photonics curriculum is hands-on. Students spend most of their time working in a laboratory environment, applying theoretical knowledge to master the use of relevant test and measurement equipment to construct

and troubleshoot advanced electro-optics systems.

Specific knowledge and skills of graduates include:

- The ability to excel as a technician in electronics, optics, laser, and photonics fields.
- Overall knowledge in laser systems, electronics, optics, and electro-optics/photonics.
- Knowledge in the fundamentals of light, including the nature of light, geometric optics, wave optics, optical components, optomechanical components, positioning equipment, the physics of laser operation, fibers and fiber optics, and overall laser safety.
- Demonstrated knowledge in electronics, including AC and DC circuits, basic electronic components, and the ability to maintain and clean equipment and tools required in the fields of optics, lasers, and photonics.
- The ability to analyze, configure, test, measure, troubleshoot, and assist with problems that arise in a profes-