

OP-TEC at Texas State Technical College Waco

OP-TEC
National Center for Optics and Photonics Education



Texas State Technical College Waco is a college partner in OP-TEC: The National Center for Optics and Photonics Education, a collaborative project funded through the National Science Foundation's Advanced Technological Education (ATE) program. The OP-TEC partners—two-year colleges, ATE grant recipients, high schools, universities, national laboratories, and professional societies—are committed to increasing the pool of well-trained technicians in optics and photonics by creating a secondary-to-postsecondary "pipeline" of highly qualified and strongly motivated students. OP-TEC will serve one- and two-year postsecondary programs devoted specifically to lasers, optics, and photonics technology as well as programs devoted to high-demand technologies that are *enabled* by optics and photonics, such as biomedicine, manufacturing, information technology, and engineering.

TSTC Waco developed the nation's first laser electro-optics technology (LET) program in 1969. Graduates of the two-year program earn an associate of applied science degree. Since the development of the LET program, the technology has grown to include an advanced technical certificate offering in biomedical laser and, most recently, an AAS in nanotechnology. The college also offers an AAS in semiconductor manufacturing technology.

The college's laser, nanotechnology, and semiconductor students train on some of industry's finest laboratory equipment valued at more than \$40 million. In the fall of 2006, the LET department will open its new Class 100 Cleanroom, valued at approximately \$450,000.

Areas of Specialization

Laser-Electro Optics Technology

Nanotechnology

Biomedical Laser

Semiconductor Manufacturing

The nanotechnology specialization gives students access to some of the most advanced, industry-standard equipment available. The lasers and optics, vacuum systems, electronic support systems, and semiconductor equipment TSTC's nanotechnology students

learn to use include:

- HeNe lasers
- CO₂ lasers
- Excimer and other lasers
- Advanced optical microscopes
- Scanning electron microscopes
- Transmission electron microscopes
- Atomic probe microscopes
- Atomic force microscopes
- Fourier transfer infrared spectrometers
- Profilometers
- X-ray spectrometers
- Laser microscopes
- Spectrophotometers
- Ellipsometers
- Optical thin film measurement tools

TSTC students in semiconductor manufacturing technology use a variety of industry-standard equipment to gain a

technical edge, including photolithography equipment; vacuum, robotic, and electronic support systems; and computerized inspection and inventory control devices such as:

- Optical thin film measurement tools
- Resistivity/conductivity measurement tools
- Four-point probes
- Minibrute 8100 tube furnaces

Staffed by a chair, six faculty members, and a lab assistant, the LET department is working to establish articulation agreements for career pathways with secondary schools both regionally and locally. These articulations will help guide high school students to careers in photonics through the laser electro-optics, semiconductor manufacturing, and nanotechnology fields. Developing these 4+2+2 career pathways will allow students to enter the workforce with an AAS degree or move through a bachelor of science degree. The college is working with Lamar State University to provide students with the opportunity to advance to a bachelor's in engineering.

The LET department is guided by an advisory board consisting of representatives from some of the nations' leading institutions including:

- University of Texas Medical Branch (Galveston, Texas)
- Baylor University (Waco, Texas)
- Rice University (Houston, Texas)
- Alcon Mfg. Ltd (Houston, Texas)
- Medical Laser Dynamics, Inc. (Highland Village, Texas)
- Laserscope (Houston, Texas)
- Lawrence Livermore National Lab (Livermore, California)
- University of Texas Southwestern Medical Center (Dallas, Texas)
- Spectra-Physics (Bruceville, Texas)
- University of Texas at Austin (Austin, Texas)

- Applied Materials (Allen, Texas)
- The Laser Medic (Bedford, Texas)
- Shermco Industries (Irving, Texas)

TSTC Waco's nanotechnology program partners with companies such as Zyvex (Richardson, Texas), Intelligent Epitaxy Technology (Richardson, Texas), University of Arkansas (Fayetteville, Arkansas), Sematech (Austin, Texas), Molecular Imprints Inc. (Austin, Texas), and Photronics (Allen, Texas).

TSTC advisory members and business partners play a critical role in ensuring that the students receive the education and training needed in today's critical and emerging fields of lasers, semiconductors, and nanotechnology.

For more information on OP-TEC at TSTC Waco

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