

LASER AND FIBER OPTICS ENGINEERING TECHNOLOGY

The Laser and Fiber Optics Engineering Technology program is the only program of its kind in the metropolitan area and is accredited by the Technology Accreditation Commission of ABET (TAC of ABET). Additional information on TAC of ABET can be found at ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202, telephone 410-347-7700 and www.abet.org.

Educational Objectives for the A.A.S. in Laser and Fiber Optics Engineering Technology

Graduates of the program will be prepared for the following career and professional accomplishments during the first three to five years following graduation:

1. Career Preparation and Advancement – Graduates will demonstrate mastery of the knowledge and skills needed for entry into or advancement in the field of Laser and Fiber Optics Engineering Technology.

2. Engineering Competence - Graduates will be competent technicians with problem solving and design skills, and have the ability to apply mathematics, science and modern engineering software to solve electrical and computer engineering technology problems.

3. Professional Skills - Graduates will have strong communication skills, and the ability to work successfully in teams in industry.

4. College Transfer - Graduates will meet the requirements for transfer into the junior year of a baccalaureate program in engineering technology

5. Well-rounded education - Graduates will demonstrate respect for diversity and knowledge of contemporary professional, societal, ethical, and global issues, and they will engage in life-long learning

Recipients of the A.A.S. degree may choose to work in industry, continue their academic studies in a Bachelor of Engineering Technology program, or do both.

The program is under the supervision of the Department of Physics.

Lasers and fiber optics have become a multi-billion dollar industry. Medical, Consumer electronic and Telecommunication applications of lasers and fiber optics are expanding very rapidly. Lasers and fiber optics are finding use in an ever-widening variety of surgical, diagnostic and medical research situations. Communications between large computers are currently transmitted via fiber optics systems, particularly in large financial institutions. The long-distance telephone system in the United States is now nearly all fiber optic, as is international long distance. Cable television is using fiber as a "backbone," for their systems and is also delivering broadband Internet access through it. Fiber to the house is becoming a reality providing even greater speed.

Other applications of laser and fiber optics technology are already standard. For example, lasers are incorporated into the scanners used at retail checkout counters and libraries. For many fabrication requirements, especially

for the materials of high technology, lasers are the instruments of choice. Laser interferometry is used for quality control and testing in applications as diverse as checking computer disks and airplane turbine fans.

The Laser and Fiber Optics program combines technical training and liberal arts courses, and students gain invaluable hands-on experience in Queensborough's laser and fiber optics laboratories which are equipped with some of the latest equipment available in the field. They learn how to operate the instruments, electronics, and materials currently used in industrial applications of lasers and fiber optics. Courses are also available through distance education including online laboratory accessible through remote-control. Equipment available for student use includes optical time domain reflectometers, number of different types of lasers (helium-neon lasers, low and high power dye lasers, 10 watt carbon dioxide laser, Q-switched modelocked neodymium-YAG lasers, Ti: Sapphire and argon lasers), optical fiber, analog and digital optical transmitters and receivers, vibration isolated optical table, fusion splicers, very high speed bit error rate testers, fiber amplifiers, and much more. A Class IV high-power laser laboratory with heavy-duty electrical wiring and filtered water at each station has been opened. The Department of Physics has extensive computer facilities. In addition to working with such equipment, students learn the principles and theories on which these applications are based.

Students in this program are individually counseled and their programs are developed in line with their academic background and personal interests. Faculty advisers work with students and help them plan their academic programs.

Laser and Fiber Optics engineering technicians are widely sought after by industry. Graduates have an excellent record in finding employment and enjoy relatively high starting salaries.

ADVISORY COMMITTEE, LASER AND FIBER OPTICS TECHNOLOGY

Barry Bhasin, *Infrared Optical Products*

Vito Caragiulo, *Cablevision*

Michael Dunn, *Time-Warner Cable*

Dr. Qiang Fu, *Quantronix*

Neil Goldman, *Enlightened Technologies Associates Inc.*

Irwin Math, *Liteway, Inc.*

Andrew Mossholder, *Symbol Technologies Inc.*

John Romeo, *Fiberwave*

Stuart Stein, *Meopta U.S.A., Inc.*

Bruce Tirri, *ASML*

Barry Zhang, *Princetel Inc.*

LASER AND FIBER OPTICS ENGINEERING TECHNOLOGY –

A.A.S. Degree Program

A TAC of ABET ACCREDITED ENGINEERING TECHNOLOGY CURRICULUM

REQUIREMENTS FOR THE A.A.S. DEGREE

GENERAL EDUCATION CORE REQUIREMENTS		Credits
EN-101, 102	English Composition I, II	6
MA-114† §	College Algebra and Trigonometry for Technical Students	4
MA-128†	Calculus for Technical and Business Students	4
PH-201*§, 202*	General Physics I, II	8
SS- or HI-	Electives in Social Sciences or History§ (HI-100 series)	6
———	Humanities Elective††	3
		Sub-total 31

REQUIREMENTS FOR THE MAJOR

ET-910	Principles of Electrical Technology	3
ET-210§, 220	Electronics I, II	8
PH-231	Fundamentals of Lasers and Fiber Optics	4
PH-232§	Laser and Electro-Optics Technology	5
PH-233	Laser/Electro-Optics Devices, Measurements and Applications	4
PH-234	Fiber Optics Devices, Measurements and Applications	4
PH-235**	Laser/Electro-Optics Projects	3
PH-236†††	Introduction to Computers in Electro-Optics	2
		Sub-total 33

Total Credits Required64

† MA-440, 441 may be substituted for MA-114, 128.

* Physics 301, 302 or 411, 412, 413 courses may be substituted for PH-201, 202.

** PH-931 may be substituted for PH-235.

††† PH-240 may be substituted for PH-236.

§ Sections of this course denoted as "WI" may be taken to partially satisfy the Writing Intensive Requirement. **Two (2) Writing Intensive classes are required for the Associate degree. See page 69.**

Note: On the basis of a Speech Placement Test administered to all students upon admission, up to two semesters of remedial speech may be required.

SUGGESTED SEQUENCE OF COURSES

Semester 1		Credits
PH-231	Fundamentals of Lasers and Fiber Optics	4
MA-114	Technical Mathematics A	4
EN-101	English Composition I	3
SS or HI	Elective in Social Sciences or History (selected from HI-100-179)	3
		Sub-total 14

Semester 2

PH-201	General Physics I	4
PH-234	Fiber Optics Devices, Measurements and Applications	4
MA-128	Technical Mathematics D	4
EN-102	English Composition II	3
ET-910	Principles of Electrical Technology	3
		Sub-total 18

Semester 3

PH-202	General Physics II	4
PH-232	Laser and Electro-Optics Technology	5
ET-210	Electronics I	4
SS or HI	Elective in Social Sciences (see page 68) or History (selected from HI-100-179)	3
		Sub-total 16

Semester 4

PH-233	Laser/Electro-Optics Devices, Measurements and Applications	4
PH-235	Laser/Electro-Optics Projects	3
PH-236	Introduction to Computers in Electro-Optics	2
ET-220	Electronics II	4
	Humanities Elective (see page 68)	3
		Sub-total 16

Total Credits Required64