

# Who Should Attend?

Engineers, scientists, technicians and managers who would like to improve their understanding of the operation and implementation of fiber optic sensor technology would benefit strongly from this course. This course is also highly useful to developers of components used in fiber optic systems who want to understand how their components are used in the emerging fiber optic sensor field as well as potential end users who are contemplating utilizing fiber

## *Some of the Companies Who Have Attended This Class:*

- Boeing
- Corning
- Westinghouse
- Ford Motor Company
- Department of Energy
- Sandia National Laboratory
- Los Alamos National Laboratory

# FIBER OPTIC SENSOR “Hands On” Course

**FIBER OPTIC SENSOR TECHNOLOGY** offers a series of advantages with respect to prior art electrical sensors that are changing the way many current products are built and will open up the opportunity for many new systems. The light weight and small size of fiber sensors are strongly complemented by their strong immunity to electromagnetic interference eliminating the need for heavy and costly shielding. The result has been widespread interest in applying this technology to aerospace structures where weight is critical. The technology is also beginning to penetrate the civil structure application area with installations on bridges and freeways. Other important market areas include oil and gas process and control, environmental sensing and naval applications.

**THIS COURSE PROVIDES** the participant with a one of a kind opportunity to learn about and work with fiber optic sensors. The curriculum includes an overview of fiber grating sensors, strain and temperature sensors, intensity liquid level sensors, fiber optic smart structures, sensors based on Sagnac and Mach-Zehnder Interferometers, and the latest discoveries in fiber optic sensors. Participants will build working fiber optic sensors and perform experiments using Blue Road Research's fiber optic laboratory equipment.

Please call us or visit our web site at  
[www.blueroadresearch.com](http://www.blueroadresearch.com)  
for current course dates



# What You Will Learn...

**Day 1** - Fiber optic sensors are comprised of light sources, modulators, light beam conditioning optics, optical fiber and detectors. These components will be reviewed and the interrelationship between their operation and characteristics and fiber sensor performance described.

**Day 2** - Interferometric fiber optic sensors have very high sensitivity and have been successfully developed for such applications as navigation, seismic sensing and intrusion control.

**Day 3** - One of the most exciting fields of fiber optic sensors is the area of smart structures where optical fibers are placed in composite materials to measure such parameters as temperature, pressure and strain. The application areas range from improving the manufacturing process to health and damage assessment systems. This part of the course will provide an overview of fiber optic

## **Morning Classroom Instruction includes:**

- Fundamental Components and Concepts
- Intensity Based Fiber Optic Sensors
- Spectral Reflection Based Fiber Optic Sensors
- Multiplexing and Distributed Fiber Optic Sensors
- The Mach-Zehnder and Michelson Interferometer
- The Sagnac Interferometer
- Fiber Grating Sensors
- Fiber Optic Smart Structures
- Environmental Sensors

## **Afternoon “Hands On” Labs include:**

- Handling and use of common fiber optic sensor components, hardware, and safety
- Splicing, cleaving and assembly techniques
- Build a liquid level fiber optic sensor
- Fiber Bragg gratings as sensors, high speed demodulation, and multi-axis grating systems
- Build a Sagnac interferometer to demonstrate the measurement of rotation and acoustic signals
  - High speed and long gage sensor systems demonstration
  - A voice-sensitive system demonstration

## **CLASS INFORMATION:**

The course will be supplemented by course lecture notes that will be provided the first day of class. Classes begin at 8:30am and conclude at approximately 5:00pm. The course is held at the Blue Road Research offices and laboratories which are located about 11 miles east of Portland International Airport. The price is \$995 for attendance at the three-day course. The program content may be customized and/or taught at your location.



Students gain “Hands On” experience during our Afternoon Laboratories

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