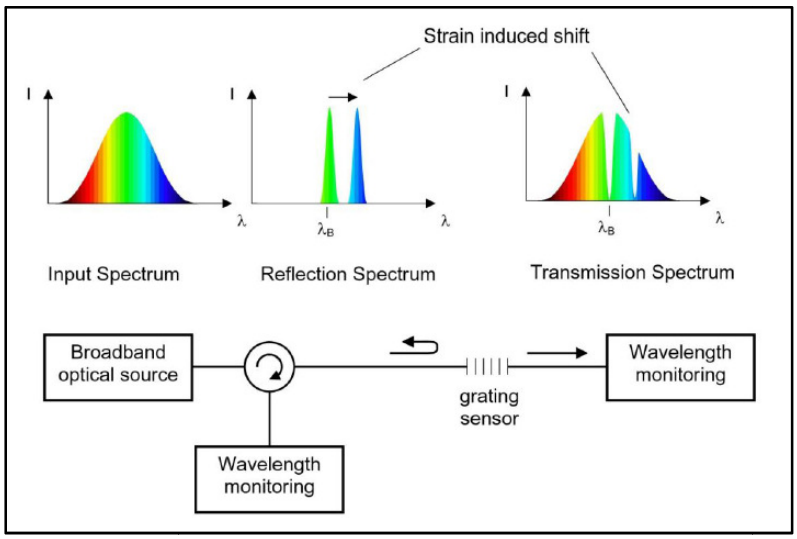
FIBER BRAGG GRATING SENSOR

Need of Fiber Optic Sensing-

Fiber Bragg Grating (FBG) is a new and a non-conventional sensing technology used in wide variety of applications nowadays. It is desired in sensing applications where there is electromagnetic and RFs interference. It is light-weight, compact and intrinsically safe to use in chemical operations. An FBG sensor can be tailored for measurement of temperature, strain, vibration, inclination with several pre-defined gratings of different wavelengths placed along a fiber allowing multiplexing capability.

Principle of FBG sensor measurement-

The FBG sensing element consists of periodical changes created in the core of single mode optical fiber by appropriate exposure to ultraviolet light. The FBG behaves as a partial mirror. The light containing a range of wavelengths will mostly pass through the FBG however, one specific wavelength will reflect back.



The reflected wavelength depends on the initial optical properties of the FBG that were embedded by the manufacturing process. In addition, the optical properties of the FBG depend linearly on the strain and the temperature. Change in one or every parameter will reflect back different wavelength to the reading unit. By determining the difference from the initial wavelength, it's possible to figure out the strain or the temperature within the FBG.