*** NEW COURSE FOR FALL 2003 ***

ECE 510 Fault Tolerant Systems

Reliable systems can be depended on to provide continual service. Unfortunately, faults are inevitable and the resulting errors can cause disruptions in service. It is not always easy—in some cases, impossible—to fix or replace faulty components quickly. A good example is a deep-space probe collecting temperature and radiation data from the outer reaches of the solar system. It will not be easy to travel to the space probe's location to fix any hardware failures. Yet, the system's operation must be restored as quickly as possible to prevent the loss of valuable data.

Fault tolerant systems are capable of remaining operational when faults occur. In some cases faulty hardware can be replaced by redundant hardware. In other cases a software solution is possible. In still other cases the faulty hardware can be reconfigured to restore operation. However, regardless of the method used, the goal is to fix the problem automatically—i.e, with little or no human involvement.

This class explores the design and analysis of fault tolerance systems. Students will be introduced to failure detection, failure masking, and failure recovery methods. Fault tolerant methods for single processor computer systems, distributed computing systems and analog control systems are all investigated. Several real-world case studies are analyzed.

The only course prerequisite is graduate standing in computer engineering, electrical engineering or computer science. A background in distributed computing and control systems is desirable, but not required.

Contact Dr. Greenwood at greenwd@ece.pdx.edu for further information.