

## **COT 5930 Data Acquisition and Control**

### **Description:**

**3 Credits, TR 2:00-3:20 PM, SE319**

*Prerequisites:* COP2212, CDA3201C and CDA3331C. Or similar classes.

This project-oriented course primarily focuses on the design and implementation of real-life data acquisition and control applications. Students learn the fundamental issues of sensing real-life signals, presenting them to digital controllers/computers, analyzing data, making decisions, and transferring control back to the real world through actuators. When actual I/O devices are not present, they are emulated. Students will also learn how to pick the right hardware/software combination to best fit any given application. The course is open for both graduate and senior undergraduate students in the Science and Engineering College.

### **Hardware:**

The class will primarily use National Instruments DAQ systems. However, based on interest, we may discuss a variety of hardware platforms from various vendors such as Computer Dynamics Pentium SBC with touch LCD screen, Motorola 68000/HC11 SBC, Z-World Compact Controllers, Diamond Systems Corp PC/104 form Data Acquisition Systems, Parallax Stamp Controllers, and others. You may build your own if you wish.

### **Software:**

A special graphical programming development package, namely LabVIEW, from National Instruments will be mainly used for the class projects. However, individual students may use other programming packages that they are comfortable with such as Visual Basic, Visual C++ or C++.

### **Grading Policy:**

Grades will be determined primarily on the completion of the project including documentation and presentation. Attendance and active participation also affect the final grade.

### **Projects:**

Projects are discussed individually and based on your background and interests. You may bring your own project idea, or ask for one. The size and complexity of the project are important measures but the completion of the projects dictates the grade.

### **Course Topics:**

*Not in order*

- |                                       |  |
|---------------------------------------|--|
| 1- NI LabVIEW Software                | 7- Communication and Control                       |
| 2- NI DAQ Systems                     | 8- Microprocessors and Microcontrollers            |
| 3- Sensors and Signal Conditioning    | 9- Embedded Controllers and Embedded Computers     |
| 4- Actuators and Buffering            | 10- Visual Programming and Virtual Instrumentation |
| 5- Signal Conversion (Analog-Digital) | 11- Your Own Topics                                |
| 6- Interface to Digital Systems       |  |