Course: ECE 48500 - Embedded Real-Time Operating Systems

Type of Course: Required for CmpE Program, Elective for EE Program

Catalog Description: An introduction to embedded real-time operating systems, with an emphasis on embedded system software development, tasks, inter-task communications and synchronization as well as network software.

Credits: 4

Contact Hours: Lecture 3, Lab 3

Prerequisite Courses: ECE 36200

Co-requisite Course: ECE 36800

Prerequisites by Topics: Experience programming in C, experience programming microcontrollers, understanding of circuits and electrical components

Textbook: None

Reference books:


**Course Objectives**

The course provides an introduction to embedded real-time operating systems. Topics covered include general embedded systems concepts, general embedded software development, real-time operating systems concepts.

**Course Outcomes**

Students who successfully complete this course will have demonstrated:

1. Familiarity with many of the issues involved with embedded systems. (k)
2. Familiarity with key Real-Time Operating System terms and concepts. (k)
3. Ability to program using system calls in a uC/OS-II environment. (a,b,c,k)
4. Ability to program an embedded system with tasks and executive. (a,b,c,k)
5. Understanding and ability to use tools to build an embedded real-time system. (b,k)
6. Ability to specify, design and implement a small embedded system. (a,b,c,k)
7. Ability to present design information effectively in the forms of technical reports and oral presentations. (g)

**Lecture Topics**

1. C language review, pointers, etc.
2. Embedded C & ANSI C
3. Debug, C Code standard
4. ARM Processor, Cortex-M3, LPC1768
5. CMSIS, LPC1768 Firmware Library
6. Theory and Principle of RTOS
7. uC/OS-II RTOS System
8. RTOS Middleware
9. RTOS Case Studies

**Computer Usage**

Indicate: High

**Laboratory Experience**

Indicate: High

**Design Experience**

Indicate: High
Coordinator          Guoping Wang, Ph.D.
Date                  03/02/2018