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| **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**  **Co-requisite Course** | ECE 36200, MA 17500 or MA 27500  ECE 36800 |
| **Prerequisites by Topics** | Experience programming in C, experience programming microcontrollers, understanding of circuits and electrical components |
| **Textbook** | Embedded Systems: Real-Time Operating Systems for ARM Cortex-M Microcontrollers Volume 3, current edition, Jonathan Valvano , ISBN: 978-1466468863 |
| **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. an ability to program an embedded system with high-level programming language (1). 2. an ability to program an embedded system with mixed language of assembly language and C/C++ language (1). 3. an ability to understand the concepts of real-time operating system, such as task scheduling, intertask communication (semaphore, mutex, queue, mail box, etc). (1) 4. an ability to design an embedded system with a real time operating system (2) 5. an ability to report engineering experimental results (3) |
| **Lecture Topics** | 1. C language review, pointers, etc. 2. Embedded C & ANSI C 3. Debug, C Code standard 4. ARM Processor, Cortex-M 5. TivaWare & TI EK-TM4C123GXL Launchpad 6. Theory and Principle of RTOS 7. FreeRTOS 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** | 10/08/2018 |