Course Name:	**ECE 56601 Real-time Operating Systems and Application**
Credit and contact hours:	(3 cr.) Class 3
Course coordinator's name	Dongsoo S. Kim
Textbook	Liu, Jane W.S. Real-Time Systems ISBN #: 9780130996510
Course information	This course introduces students to the principles of modern operating systems focusing on real-time operating systems and embedded operating systems and their applications. **Prerequisites/ Co-Requisite** P: Senior standing in the degree program and ECE 36200, or Graduate standing. **Required, Elective, or Selected Elective:** EE Elective, CE Elective
Goals for the course	Upon successful completion of the course, students should be able to 1. To describe the difference among general OS, real-time OS, and embedded OS; and identify their similarities. [1,2] 2. To describe static components and dynamic properties of modern operating systems. [1,2] 3. To distinguish the difference between kernel functions and user functions. [1] 4. To identify race conditions among processes and to resolve them with synchronizations. [1] 5. To design and implement real-time application using an embedded operating system and lightweight processes. [1]
List of topics to be covered	1. Introduction to Operating Systems 2. Process and process control block, Communication between processes 3. Threads and multithreading models, Job scheduling, scheduling algorithm, multiprocessor scheduling, real-time scheduling 4. Synchronization: Critical-section, semaphores, monitors, Deadlock prevention, deadlock avoidance and deadlock detection 5. File system structure and access methods, File system interfaces, file sharing and protection 6. I/O systems and I/O interfaces: Polled I/O, Interrupt-Driven I/O, and Direct Memory Access 7. Watchdog: Hardware failure recovery 8. Boot Loader: Initial hardware/software interfaces
Syllabi approved by	Dongsoo S. Kim
Date of approval	03/01/2022