

## ECEn 425. Real-Time Operating Systems

<b>Catalog Description:</b>	<b>ECEn 425. Real-Time Operating Systems. (4:3:3) F</b> Hardware/software interface, real-time kernel internals, implementation of high-level language constructs, issues in real-time application software development.	
<b>Course Type:</b>	Engineering Topics	
<b>Prerequisites:</b>	ECEn 324	
<b>Textbooks and/or other required materials</b>	An Embedded Software Primer, David E. Simon, Addison Wesley, 1999.	
<b>Topics Covered:</b>	<p>The 8086 architecture and class tool set  Interrupts, interrupt service routines, interrupt latency  Software architectures for real-time systems  RTOS functionality, structure, and support for application software  RTOS implementation and design tradeoffs  The shared data problem, reentrant functions, and dealing with concurrency  RTOS support for semaphores, queues, mailboxes, pipes, events  Case studies in problems with embedded computing in society  Design issues for real-time applications using an RTOS  Memory considerations in embedded systems  Alternatives in development tools for embedded and real-time systems  Challenges of testing and debugging embedded software</p>	
<b>Course Competencies:</b>	Ability to apply C and assembly programming languages and knowledge of the hardware/software interface to the design and implementation of a real-time kernel.	Outcome 1
	Ability to design and implement a real-time application.	Outcome 3
	Ability to design and implement a real-time kernel.	Outcome 3
	Ability to use C programs, compilers, and debuggers in the design and implementation of real-time application software.	Outcome 11
	Ability to write interrupt service routines.	Outcome 11
	Ability to use a real-time operating system as a tool in the development of real-time application software.	Outcome 11
<b>Schedule:</b>	Lectures: MWF 9:00-9:50AM Laboratory: open access (computer lab in 425 CB) TA Recitations: TTh 9:00-9:50AM	
<b>Prepared by:</b>	James Archibald	
<b>Date:</b>	June 24, 2008	