Department	Electrical and Computer Engineering
Course Number	**EE 371**
Course Title	Microprocessor Hardware and Software Systems
Course Designation	Required
University Catalog Description	Semesters offered: F,S; Prerequisites: EE 261 -- Introduction to the structure of microprocessors, arithmetic and logic units, processor control, interrupts, memories, and input/output. Laboratory experience in assembly level programming of microprocessor applications.
Faculty Coordinator	Dr. Brock J. LaMeres
Prerequisite by Topic	Boolean algebra; combinational and sequential logic design; operation of flip-flops; high-level language programming.
Textbook	"Software and Hardware Engineering", 2nd Edition. Fredrick M. Cady, Oxford University Press, 2008
Course Objectives	To produce graduates who understand the basic operation of a microcontroller system and who have learned fundamental programming skills in assembly language
Course Learning Outcomes	At the conclusion of EE 371, students are expected to : 1) Describe the basic architecture of a stored-program computer. 2) Describe the addressing modes of a sample microcontroller. 3) Apply the principles of top down design to microcontroller software development 4) To write assembly language programs for the Motorola M68HC12 5) To write assembly language code for high-level language structures such as IF-THEN-ELSE and DO-WHILE. 6) To describe a typical I/O interface and to discuss timing issues 7) To describe different types of memory used in microcontroller systems
Topics Covered	1) Introduction; Digital review; data types and numbering systems 2) Processor Organization; data path organization and register transfers; MC68HCS12 registers, instruction set; program flow control 3) Memory; addressing modes, data structure, MC68HCS12 memory map 4) Input/Output 5) Programming; software engineering; subroutine calls 6) Input/Output Systems 7) Interrupts 8) Timers 9) Serial Interfaces (CAN, SPI, SCI)
Class/Laboratory Schedule	EE371 meets three times/week for 50 minutes plus a two-hour laboratory session.
Professional Component (Criterion 5)	This course strongly supports the use of top down design principles to identify, analyze and solve engineering programming problems.
ECE Program Outcomes	EE 371 supports following Program Outcomes: c. An ability to design a system, component, or process to meet desired needs n. An ability to program microcontroller/microcomputer systems using assembly and high-level languages o. An ability to design digital systems using modern design tools. q. An ability to implement real-time systems.
Total Credit Hours	4
Prepared by	Brock J. LaMeres 5/19/2009