WASHINGTON STATE UNIVERSITY
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School of Engineering and Computer Science

ECE 234: Microprocessor Systems
Master Syllabus

Catalog Data:	**ECE 234: Microprocessor Systems**; 3 credits (2-3) Microprocessor system architecture, instruction sets, and interfacing; assembly language programming. Typically offered in Spring.
Class Schedule:	Two lectures hours per week, for one semester.
Laboratory Schedule:	One 3-hour lab session per week, for one semester.
Prerequisites by Course:	CS 251 or CS 261; ECE 214
Prerequisites by Topic:	1. Ability to design, code, and debug computer programs written in an imperative programming language such as C. 2. Ability to design and implement combinational logic circuits.
Typical Text:	*Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language and C: Third Edition* Y. Zhu, E-Man Press 2017, ISBN 978-0-9826926-6-0.
Course Coordinator:	Dr. John Lynch
Course Objectives:	Students taking this course will: 1. Design, code and debug a program, using assembly language, which performs an iterative or recursive algorithm, such as sort or search, and which implements the function calling conventions of a high level language. 2. Construct a hardware interface between a computer and an external device and program the computer to manipulate the device. 3. Become familiar with the basic von Neumann stored program computer architecture as implemented in modern microprocessors.
Topics Covered:	1. Overview of transistors, gates and semiconductor technology 2. Review of combinational and sequential logic 3. The von Neumann stored program architecture 4. Instruction set architectures 5. Assembly language programming and interfacing with C 6. Memory organization and addressing modes 7. Interrupts and I/O architecture 8. Bus structures and datapaths
Lab Experiments and Activities:	1. Introductory assembly language program 2. Assembly language flow of control instructions and iteration 3. Complex instructions, such as repetition, loops 4. Interrupt handling 5. Construct a hardware interface to an external device and write a program to control it

Course Outcomes:	Students will be able to:			
	Assessed for Student Outcomes	2-b Apply design process to satisfy project requirements for microprocessor systems. 2-d Produce solutions using microprocessors that meet specified needs. 3-a Produce lab reports and/or research papers using appropriate formats and grammar with discipline-specific conventions.		
	Other	4-a. Evaluate the global, economic, environmental and societal impacts of microprocessors. 6-b. Use appropriate equipment and techniques to debug microprocessor systems. 7-a. Use resources effectively to learn new material not taught in class.		
Relationship of Course to Program:		Meets: Educational Objectives 1, 2, 3, 4 Student Outcomes 2, 3, 4, 6, 7		
Prepared by:		Dr. John Lynch	Date:	03/2018; 2/21/18 (mb); 6/22/21 (mb) Jan. 4, 2010 revised :10/2011 Revised 02/12, revised 9/4/12, revised 09/2017