WASHINGTON STATE UNIVERSITY
VANCOUVER
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School of Engineering and Computer Science

ECE 424: Computer Architecture and Design
Master Syllabus

Catalog Data:	**ECE 424: Computer Architecture and Design**; 3 credits Architecture, organization and design of modern digital computers; instruction sets, computer arithmetic, pipelining, memory hierarchy, storage and input/output topics. Typically offered in Fall.
Class Schedule:	Three lecture hours per week, for one semester.
Laboratory Schedule:	None
Prerequisites by Course:	ECE 234 or CS 261
Prerequisites by Topic:	1. Digital system design and simulation 2. Microprocessor concepts 3. Assembly language programming
Typical Text:	Clements, A., *Computer Organization and Architecture*, Cengage 2014
Course Coordinator:	Dr. John Lynch
Course Objectives:	Students will: 1. Apply principles of computer architecture, organization and design. 2. Understand instruction sets and the hardware/software interface. 3. Analyze cost/performance tradeoffs in computer design. 4. Explain current trends and future directions of computer architecture.
Topics Covered:	1. Fundamentals of computer design (technology, cost, quantitative measures, etc.) 2. Instruction set design 3. Processor design 4. Computer arithmetic 5. Pipelining 6. Instruction level parallelism 7. Amdahl's law 8. Memory hierarchy: virtual memory and cache design 9. Hardware/software tradeoffs 10. Interconnects and Buses 11. I/O system organization 12. Multiprocessor principles 13. Hardware multithreading
Lab Experiments and Activities:	None

Course Outcomes:	Students will be able to:			
	Assessed for Student Outcomes	1-b. Evaluate information to identify computer architecture problems. 1-d Apply probability and statistics in analyzing computer performance data such as branch prediction and cache hit/miss rates. 2-a Define computing problems from specified needs.		
	Other	2-c. Analyze computational needs within realistic constraints and economic factors.		
Relationship of Course to Program:		Meets: Educational Objectives 1, 2 Student Outcomes 1, 2		
Prepared by:		Dr. John Lynch	Date:	December 30, 2009, revised 12/3/13, revised 03/2018 (mb) Revised 9/4/18 JL 11/02/18 JL/mb