Required Course:	**ECE 36500 Introduction to the Design of Digital Computers**
Credit and contact hours:	(3 cr.) Class 3, Lab 0
2020-21 IUPUI Campus Bulletin description:	ECE 36500 Introduction to the Design of Digital Computers (3 cr.) P: ECE 36200. Class 3. The hardware organization of computer systems: ARM instruction set architecture, processing unit, pipeline, arithmetic/logic unit design, hardwired and microprogrammed control schemes, memory and cache organization, I/O and interrupt interface design.
Prerequisite or corequisite:	P: ECE 362
Prerequisites by topic:	Digital devices, Number representation and codes, Computer programming.
Textbook:	C. Hamacher, Z. Vrannesic, S. Zaky, and N. Manjikian, Computer Organization and Embedded Systems, Sixth Edition, McGraw-Hill, 2011. ISBN: 978-0-07-338065-0
Coordinator:	John Lee, Associate Professor of Electrical and Computer Engineering
Goals:	To teach junior or senior engineering students computer design and analysis techniques beginning with computer organization and ending with performance analysis.
Outcomes:	Upon successful completion of the course, students should be able to 1. Describe different types of instruction set architecture [1] 2. Design a processing unit of a microprocessor [1] 3. Describe the concept of processor pipelining and its performance impact [1] 4. Describe the memory organization with caches and their performance impact [1] 5. Describe the key components of computer systems and their operation [1] 6. Design an Arithmetic Logic Unit [1]
Topics:	1. Basic computer organization (1 class) 2. Instruction set architectures (4 classes) 3. I/O organization and devices (2 class) 4. Processing unit organization (3 classes) 5. Pipelined processor organization (3 classes) 6. Memory/cache organization (6 classes) 7. Arithmetic and logic unit design (5 classes) 8. Exams (2 classes and final exam period)
Computer usage:	Computer programming
Laboratory projects:	None.
ABET category:	Engineering science 50% and engineering design 50%
Prepared by:	John Lee
Date:	October 22, 2021