Montgomery County Community College
CIS 126
Computer Architecture & Organization
3-2-2

COURSE DESCRIPTION:
This course is designed to explore how a computing system works and introduces the student to the organization and architecture of computer systems using the Assembly programming language. Computer Science students will gain insight into the functional components of a computer system. Topics covered will include digital logic, data representation, interfacing and I/O strategies, memory architecture, a computer's

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
4. Describe the architecture of a computer by defining the relationship between instruction set architecture, micro architecture, and system architecture.	Lecture Discussion	Competency Checklist
5. Define instruction set architecture (ISA), machine-level instruction in terms of its functionality and resource use (registers and memory) and the difference between register-to-memory ISAs and load/store ISAs.	Lecture Discussion Homework Assignments	Live Computer Lab Demonstration Exams
6. Distinguish between the various classes of instruction: data movement, arithmetic, logical, and flow control.	Lecture Discussion	Competency Checklist
7. Implement Assembly language code to demonstrate how subroutines are called, parameters are passed, and returns are made.	Lecture Discussion Hands-On Lab Exercises Homework Assignments	Live Computer Lab Demonstration Quizzes

8. Explain open- and closed-loop
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LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
15. Describe superscalar architectures that use multiple arithmetic units to execute more than one instruction per clock cycle.	Lecture Discussion	Quizzes
16. Explain performance measurement limitations when using MIPS or SPECmarks.	Lecture Discussion	Live Computer Lab Demonstration
17. Analyze the relationship between power dissipation and computer performance and the need to minimize power consumption in mobile applications.	Lecture Discussion	Quizzes

18. Describe techniques used to enhan

6. Multiprocessing
    a. Amdahl's law
    b. Short vector processing (multimedia operations)
    c. Multicore and multithreaded processors
    d. Flynn's taxonomy: Multiprocessor structures and architectures
    e. Programming multiprocessor systems
    f. GPU and special-purpose graphics processors
    g. Introduction to reconfigurable logic and special-purpose processors

LEARNING MATERIALS:
Computer Organization and Architecture: Designing for Performance.
10th Edition. Stallings, Prentice Hall. 2015. ISBN: 9780134101613.
Learning materials, such as links to online Assembly Language programming resources, will be made available to the student via the course management system.

COURSE APPROVAL:
Prepared by: Marie Hartlein   Date: 1995
Revised by: Kathy Kelly   Date: 4/2012
Revised by: Larry Elias   Date: 7/10/13
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