

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

**COMPUTER ORGANIZATION
CSIT 1600**

Class Hours: 3.0

Credit Hours: 4.0

Laboratory Hours: 3.0

Revised: August 4, 2011

Catalog Course Description:

Number systems, Boolean algebra, combinational and sequential circuits, processor functional units and control, pipelining, memory and caching, stored program computing, memory management, computer system organization, assembly language programming.

Entry Level Standards:

The student must have math, writing, verbal and English language skills at the college entry-level.

Prerequisites:

CSIT 1020 or department approval.

Corequisites:

None.

Textbook(s) and Other Course Materials:

Textbook: The Essentials of Computer Organization and Architecture, Linda Null and Julia Lobur, Jones and Bartlett, third edition. ISBN: 978-1-4496-0006-8

I. Week/Unit/Topic Basis:

Week	Topic
1	Chapter 1: Introduction to Computer Organization
2	Chapter 2: Data Representation
3	Chapter 3: Boolean Algebra and Digital Logic
4	Chapter 3: Boolean Algebra and Digital Logic
5	Test 1 (chapters 1, 2, 3). Chapter 4: A Simple Computer
6	Chapter 4: A Simple Computer.
7	Chapter 5: Instruction Set Architecture (ISA)
8	80x86 Assembly Language
9	80x86 Assembly Language
10	Test 2 (chapters 4, 5, 80x86 assembly language). Chapter 6: Memory
11	Chapter 6: Memory
12	Chapter 7: I/O (up to Floppy Disks, 7.6.2), System Software (up to Database software, 8.6)

- 13 System Software (up to Database software, 8.6), Alternative Architectures (up to Alternative Parallel Processing Approaches, 9.5)
- 14 Test 3 (chapters 6, 7, 8, 9 and 80x86 assembly language)
- 15 Final Exam Period: comprehensive final exam

II. Course Goals*:

The course will

- A. Teach students how computer data is represented. II, III, IV
- B. Teach students how to use digital logic to create combinational and sequential circuits. II, III, IV, V
- C. Teach students the instructions cycle and how the processor uses the ALU, registers and pipelining. II, III, IV
- D. Teach students the concepts behind an Instruction Set Architecture (ISA). I, III
- E. Teach students how main memory is addressed and how cache and virtual memory are used. I, III
- F. Teach students how secondary storage is accessed and organized. I, III
- G. Teach students basic parallelism techniques and issues. I, III
- H. Teach students how to use an assembly language to write programs to solve problems. II, III, IV, V
- I. Require students to practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. I

*Roman numerals after course objectives reference goals of the CSIT program (Career Program Goals and General Education Goals are listed http://www.pstcc.edu/departments/curriculum_and_instruction/syllabi/)

III. Expected Student Learning Outcomes*:

Students will be able to:

- 1. Calculate the data representation of signed integer and floating-point values. (A)
- 2. Design, implement and test combinational and sequential circuit designs that meet specified requirements. (A, B, C, D, E, I)
- 3. Explain the fetch-decode-execute instruction cycle and how registers are used for instructions and data. (C, D, E)
- 4. Use simple calculations to demonstrate how instruction pipelining improves processor performance. (C, G)
- 5. Describe and use basic ISA-level concepts such as registers and stacks, memory addressing modes and ISA-level instruction types and formats. (A, C, D, E, H)
- 6. Design, implement and test assembly language programs that meet specified requirements. (A, C, D, E, H, I)
- 7. Describe the compilation, assembly and linking processes. (D, H)
- 8. Explain how memory is addressed and organized. (A, B, C, D, E)

9. Calculate cache miss and hit rates, map main memory addresses to cache blocks. (E)
10. Describe the difference between physical and virtual memory addresses and calculate physical addresses. (E, F)
11. Explain cache organizations.(E)
12. Describe basic parallel processing techniques. (G)
13. Describe storage and I/O concepts such as DMA, polling, disk sectors, seek time and latency. (F)
14. Use error correction codes. (A, F)

* Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

IV. Evaluation:

A. Testing Procedures: 50% of grade

Three exams will be given and one optional, comprehensive final exam. Failure to make a passing test average will result in a grade of F for the course.

B. Laboratory Expectations: 50% of grade

Ten labs will be given, 5 digital circuit labs and 5 assembly language labs. Failure to make a passing lab average will result in a grade of F for the course.

C. Field Work:

None.

D. Other Evaluation Methods

None.

E. Grading Scale:

A: 93 – 100; B+: 88 – 92; B: 83 – 87; C+: 78 – 82; C: 73 – 77; D: 65 – 72; F: below 65

V. Policies: .

A. Attendance Policy: from the PSCC catalog

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of the Learning Division, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of the Learning Division.

Maintaining continuous attendance in your classes is very important. If you are considering dropping or withdrawing from a course, please check with the Financial Aid Office before doing so. Dropping or withdrawing from a class can adversely affect your financial aid and/or lottery eligibility.

B. Academic Dishonesty: from the PSCC catalog

The College policy that prohibits plagiarism, cheating and other forms of academic misconduct. A student guilty of academic misconduct, either directly or indirectly, through participation or assistance, may be assigned an F or a zero for the exercise or examination or an F in the course, at the discretion of the instructor.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/.

D. Other Policies:

College-owned or –operated computing resources are provided for use by students of Pellissippi State. All students are responsible for the usage of Pellissippi State's computing resources in an effective, efficient, ethical and lawful manner.

Students are expected to promptly attend all lecture and lab classes as assigned. If a class is missed, student must make up all work and get notes and/or handouts