

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**MACHINE ORGANIZATION
CST 1410**

Class Hours: 3.0

Credit Hours: 4.0

Laboratory Hours: 3.0

**Date Revised: Fall
1999**

Catalog Course Description:

A study of assembly language and computer organization. Topics include number systems, internal storage of data, assembly language techniques, internal computer organization and I/O.

Entry Level Standards:

None

Prerequisite:

CST 1110

Corequisite:

CST 1540

Textbook(s) and Other Reference Materials Basic to the Course:

Kindred, Alton R.; *Data Structured Assembler Language for IBM Microcomputers*; Oxford University Press; 1991

I. Week/Unit/Topic Basis:

| Week | Topic |
|-------------|--|
| 1 | Computer Fundamentals, Hexadecimal and Binary Data Codes, Using MS-DOS Debug |
| 2 | Assembly Process, Using QuickAssembler, Segments, Simple Directives and Assembler Instructions |
| 3 | BIOS and DOS Interrupts |
| 4 | Program Logic and Control Structures |
| 5 | Arithmetic and Logical Operations and Instructions, Test 1 |
| 6 | Simple Combinational Digital Logic Devices |
| 7 | Subroutines and the Stack, Recursion |
| 8 | Separately Assembled Modules, Parameter Passing, Libraries |

| | |
|----|--|
| 9 | Addressing Modes, Single-dimension Arrays, Strings |
| 10 | Advanced Arithmetic, Test 2 |
| 11 | Multi-dimension Arrays, Direct Screen I/O |
| 12 | Structures and Records |
| 13 | Macros |
| 14 | Conditional Assembly |
| 15 | Introduction to RISC Architecture, Test 3 |
| 16 | Final Exam |

II. Course Objectives*:

- A. Demonstrate familiarity with the architecture and operation of the IBM PC family of computers. I, II, III, IV, V, VI
- B. Demonstrate an understanding of basic assembly language techniques by writing short, modular programs in IBM assembler and using these modular programs to enhance understanding of high-level languages. IV, V, VI, VIII, IX
- C. Use binary, decimal, and hexadecimal codes to demonstrate an understanding of how programs and data are stored. III, IV
- D. Apply Boolean algebra to design and implement algorithms and digital logic to design and implement simple hardware components of a computer. III, V, VI
- E. Use program development facilities and utilities to create executable programs. IV
- F. Demonstrate an understanding of a hierarchial directory structure and manipulate files within this structure. IV

*Roman numerals after course objectives reference goals of the Business and Computer Technologies department.

III. Instructional Processes*:

Students will:

1. Create several short modular programs using 8086/8088 assembler which implement several common algorithms and data structures. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Active Learning Strategy*
2. Examine and implement algorithms that are efficient and reliable. *Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Active Learning Strategy*
3. Use professional tools to produce software components and documentation. *Technological Literacy Outcome, Transitional Strategy*
4. Use professionally accepted methods and materials in the approach to completion of applications. *Technological Literacy Outcome, Personal Development Outcome, Transitional Strategy*

5. Practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. *Personal Development Outcome*

*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Learn the syntax and semantics of C programming language. A
2. Utilize advanced C programming statements in large programs. B
3. Understand simple data types, arrays, structures and unions. B
4. Understand implementation of abstract data structures via pointers. B, C
5. Understand links, stacks, queues, linked-list and binary tree searching. C
6. Understand trees and tree traversal. C
7. Understand recursive functions. C, D
8. Understand various sorting and searching techniques. D
9. Understand graphs and graph traversal. D
10. Understand hashing techniques. D
11. Understand heaps and their applications. D
12. Write a large program using various data structures. E, F
13. Use recursion as an alternative to linear solutions. A, B, C, G

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures: 60% of grade

There will be three 50-minute tests. Dates will be announced in class and each test will count as a percent of the final grade as follows:

Test 1 10%

Test 2 20%

Test 3 30%

An optional comprehensive final will also be offered with the grade being averaged with the 3 required tests.

B. Laboratory Expectations: 20% of grade

Several laboratory assignments will be given for the term. Assignments will be selected from topics covered in class. Failure to complete all laboratory assignments will result in a grade of F in the course. Late assignments will be assessed a penalty of 10% the first day, 30% the second day, and 100% the third day.

C. Field Work:

None

D. Other Evaluation Methods: 20% of grade

A quiz over the current or any previous class or laboratory topic may be given at any time, with or without notice, in class or in lab. There will be no makeup quizzes for any reason. If all quizzes are taken, approximately 25% of them will be dropped to determine the student's quiz "average".

E. Grading Scale:

90 - 100 A

80 - 89 B

70 - 79 C

65 - 69 D

0 - 64 F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.

B. Academic Dishonesty:

You are expected to do your own work in this class. If you are unable to complete an assignment on your own, it is your responsibility to get help from the professor (before the assignment is due).

C. Other Policies:

All exams are required, and make-ups will be allowed only in the rarest of cases. In the event that you have an emergency, you must notify the instructor in advance if at all possible.