PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

MACHINE ORGANIZATION
CSIT 1410

Class Hours: 3.0 Credit Hours: 4.0
Laboratory Hours: 3.0 Date Revised: Fall 04

NOTE: This course is not designed for transfer credit.

Catalog Course Description:

A study of assembly language and computer organization. Topics include organization, architecture, number systems, storage concepts, I/O, memory management and process management.

Entry Level Standards:

Students must have English, math, and reading skills at the college level.

Prerequisite:

CSIT 1110 and 1540

Textbook(s) and Other Course Materials:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Internal Representation of Data &amp; Programs, <em>Chapter 1</em></td>
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<tr>
<td>2</td>
<td>Parts of a Computer System, Number Systems, <em>Chapter 2</em></td>
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<tr>
<td>3</td>
<td>Elements of Assembly Language, <em>Chapter 3</em></td>
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<td>4</td>
<td>Basic Instructions, <em>Chapter 4</em></td>
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<td>5</td>
<td>Branching and Looping, Test I; <em>Chapter 5</em></td>
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<tr>
<td>6</td>
<td>Stack Operations; <em>Chapter 6</em></td>
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<td>7</td>
<td>Separately Assembled Procedures, <em>Chapter 6</em></td>
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<td>8</td>
<td>Logical Operations, Shifting, Rotating; <em>Chapter 7</em></td>
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<td>9</td>
<td>Bit Manipulation; <em>Chapter 8</em></td>
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<td>10</td>
<td>String Operations - Test II; <em>Chapter 9</em></td>
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<tr>
<td>11</td>
<td>The Assembly Process, Inline Assembler; <em>Chapter 9</em></td>
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<td>12</td>
<td>Macro Definition and Expansion, <em>Chapter 10</em></td>
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<td>13</td>
<td>Floating Point Architecture and Emulation, Chapter 10</td>
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<td>14</td>
<td>Decimal Arithmetic; <em>Chapter 11</em></td>
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<td>15</td>
<td>Test III</td>
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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 CSIT program.

III. Instructional Processes*

Students will:

1. Create several short modular programs using 80x86 assembler which implement several common algorithms and data structures. Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Personal Development Outcome, Transitional Strategy, Active Learning Strategy

2. Examine and implement algorithms that are efficient and reliable. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Personal Development Outcome, Transitional Strategy Outcome, Active Learning Strategy

3. Use professional tools to produce software components and documentation. Technological Literacy Outcome, Personal Development Outcome, Transitional Strategy, Active Learning Strategy

4. Use professionally accepted methods and materials in their approach to completion of applications. Technological Literacy Outcome, Personal Development Outcome, Transitional Strategy, Active Learning 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 TBR’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. Identify and use the major addressing modes of PC assembler. A,B

2. Write programs in PC assembler making use of the processor status word for conditional branching. A,B,D

3. Be able to implement a stack using PC assembler and make use of the user stack. A,B
4. Write functions and procedures in PC assembler. A,B
5. Write programs in PC assembler which call functions and procedures and pass arguments. A,B
6. Define, invoke and expand macros in PC assembler programs. A,B,D
7. Use the PC bit instructions to implement the laws of logic and Boolean algebra. A,B,D
8. Write PC assembler programs which call system macros and procedures. A,B
9. Create modular programs using PC assembler. B
10. Produce list files produced from PC assembler source files, relating the machine code produced to the PC assembler statements which produced it. B,C
11. Know the different internal formats of integers, real numbers and character data and be able to convert between the forms whenever possible. C,D
12. Use Debug in debugging programs. A,B,C,D
13. Write high-level language modules which call PC assembler assembler modules or vice-versa.
15. Use the major assembler directives for memory reservation and initialization. A,B,C
16. Explain the operation of 2-pass assembler, such as the PC assembler. B,C
17. Use the linker and answer questions concerning the linking process. B
18. Create and use a macro library using PC assembly language. B
19. Create, edit, delete, rename, copy and display the contents of files. A,E,F
20. Use PC compilers, assembler, linker and symbolic debuggers to develop programs. A

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

V. Evaluation:

A. Testing Procedures:

A minimum of three tests is recommended. Tests will cover material presented in class. Tests are not to be missed without a valid excuse.

B. Laboratory Expectations:

Lab attendance is required. Assignments will be given and must be completed and handed in on the designated date. The student is expected to turn in all required documentation for each lab.

C. Field Work:

N/A

D. Other Evaluation Methods:

Class participation, quizzes and homework will also comprise the final grade for the course.

E. Grading Scale:

93 – 100 A
88 – 92 B+
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.

[NOTE: No differentiation is noted for excused/unexcused absences. These will be treated as an absence.] (Pellissippi State, 2004-2006 Catalog, page 83)

B. Academic Dishonesty:

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular Pellissippi State procedures as a result of academic misconduct, the instructor has the authority to assign an F or a zero for the exercise or examination or to assign an F in the course. (Pellissippi State, 2004-2006 Catalog, pages 62-63)

C. Accommodations for disabilities:

If you need accommodation because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Privately after class or in the instructor's office. To request accommodations students must register with Services for Students with Disabilities: Goins 127 or 131, Phone: (865) 539-7153 or (865) 694-6751 Voice/TDD.

D. Other Policies:

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.

Computer Usage Guidelines:

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. (Pellissippi State, 2004-2006 Catalog, pages 67-70)