Class Hours: 3.0                         Credit Hours: 4.0
Laboratory Hours: 3.0                   Revised: Fall 2014

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, and assembly language programming are components of the course.

Entry Level Standards:

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

Prerequisites:

CISP 1010 or CSIT 1510

Corequisites:

none

Textbook(s) and Other Course Materials:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chapter 1 - Introduction</td>
</tr>
<tr>
<td>2</td>
<td>Chapter 2 - Data Representation</td>
</tr>
<tr>
<td>3</td>
<td>Chapter 3 - Boolean Algebra and Digital Logic</td>
</tr>
<tr>
<td>4</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>5</td>
<td>Chapter 4 - A Simple Computer</td>
</tr>
<tr>
<td>6</td>
<td>Chapter 4, Chapter 5 - Instruction Set Architecture</td>
</tr>
<tr>
<td>7</td>
<td>Chapter 5, Test 1 (chapters 1 – 5)</td>
</tr>
</tbody>
</table>
II. Course Goals*:

The course will

A. Teach students knowledge of principles and underlying concepts of binary numbers, Boolean algebra and logic gates. I,II,III,IV,VI,IX,XI

B. Enable the students to logically manipulate binary data and some of a computer's hardware through digital circuit design and assembly language programming. I,II,III,IV,V,VI,XI

C. Teach students about the functionality of basic hardware components of a digital computer such as registers, CPU, ALU, memory and I/O devices. I,II,III,IV,V,VI,XI

*Roman numerals after course objectives reference goals of the CIST program.

III. Expected Student Learning Outcomes*:

Students will be able to:

1. Calculate unsigned, signed and floating-point binary number values. (A)
2. Design, implement, and test the hardware for a system using a digital circuit simulator. (A, B)
3. Design, implement, and test assembly language programs. (A, B)
4. Describe and use basic ISA-level concepts such as registers and stacks, memory addressing modes and ISA-level instruction types and formats. (A, B)
5. Detect/correct errors using error detection/correction codes. (A, C)
6. Explain the fetch-decode-execute cycle. (C)
7. Describe pipelining, parallel processing and calculate speedup. (C)
8. Calculate cache miss and hit rates, map main memory addresses to cache blocks. (C)
9. Describe the difference between physical and virtual memory addresses and calculate physical addresses. (A, B, C)
10. Describe direct memory access, the difference between polling and the difference between character and block I/O. (C)

11. Describe disk sectors, error correction codes and calculate disk latency. (C)

12. Explain cache replacement and write policies. (C)

13. Describe basic issues of process management. (C)

14. Describe the compilation, assembly and linking processes. (C)

15. Explain the difference between RISC and CISC. (C)

16. Describe different parallel processing techniques. (C)

17. Use professionally accepted methods and materials in their approach to completion of applications. (A, B, C)

18. Practice elements of the work ethic such as punctuality, professionalism dependability, cooperation, and contribution. (A, B, C)

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

IV. Evaluation:

A. Testing Procedures: at least 40% of grade

   At least two exams will be given. Failure to make a passing test average will result in a grade of F for the course.

B. Laboratory Expectations: at least 40% of grade

   At least 4 digital and 4 assembly language labs will be given. Failure to make a passing lab average will result in a grade of F for the course.

C. Field Work:

   N/A

D. Other Evaluation Methods:

   Quizzes and homework as indicated by the instructor in a supplement to the syllabus. The remaining 20% of the grade at the discretion of the instructor.

E. Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93 – 100</td>
</tr>
<tr>
<td>B+</td>
<td>88 – 92</td>
</tr>
<tr>
<td>B</td>
<td>83 – 87</td>
</tr>
<tr>
<td>C+</td>
<td>78 – 82</td>
</tr>
<tr>
<td>C</td>
<td>73 – 77</td>
</tr>
<tr>
<td>D</td>
<td>65 – 72</td>
</tr>
<tr>
<td>F</td>
<td>Below 65</td>
</tr>
</tbody>
</table>

V. Policies:

A. Attendance Policy:
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 Academic Affairs, 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 Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

• Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
• Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
• Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one’s own work.
• Taking an exam for another student.
• Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
• Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that 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 Disability Services (DS) in order to receive accommodations in this course. Disability Services may be contacted by sending email to disabilityservices@pstcc.edu, or by visiting Alexander 130. More information is available at http://www.pstcc.edu/sswd/.

D. Other Policies:

Computer Usage Guidelines:
College-owned or -operated computing resources are provided for use students of Pellissippi State Community College. All students are responsible for the use of Pellissippi State’s computing resources in an effective, efficient, ethical and lawful manner.