Class Hours: 3.0  Credit Hours: 4.0
Laboratory Hours: 3.0  Date Revised: Spring 02

Catalog Course Description:

This course addresses core skills and techniques needed to succeed in computer programming. Topics include a discussion of basic skill sets needed by programmers, approaches to thinking through problems, the lifelong learning demands of the computing field, professional ethics and discipline, problem decomposition, structured design techniques, and individual creativity in programming.

Entry Level Standards:

The entering student should have a solid basic understanding of computer operation, be able to use a standard computer keyboard, and maintain a typing rate of 23 words per minute with 5 or fewer errors.

Prerequisites:

CST 1540 and ENGL 1010

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

Required Textbook:
TBA

Suggested Optional Supplementals:
Outside reading will be assigned from handouts or from publicly available Internet sites.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, thinking and learning</td>
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<tr>
<td>2</td>
<td>Review number systems and algebra word problems, history of computing</td>
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<tr>
<td>3</td>
<td>Educational demands of CS, Boolean algebra, digital logic</td>
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<tr>
<td>4</td>
<td>Exam 1, review hardware/software layers, computer organization, deductive logic</td>
</tr>
<tr>
<td>5</td>
<td>Computation, program task descriptions, cognitive processes</td>
</tr>
<tr>
<td>6</td>
<td>Success in computing, student aptitudes and expectations</td>
</tr>
<tr>
<td>7</td>
<td>Salary and work expectations in CS, Exam 2</td>
</tr>
</tbody>
</table>
Learning processes, roles of teachers and students

Analogical reasoning, discipline and work ethic, organization

Planning, flowcharts, problem decomposition

Language syntax, thinking through problems, biases in problem solving

Recognizing and taking advantage of patterns, Exam 3

Professional ethics, team dynamics, software implementation

The computer as a tool, computers and society, computer crime

Privacy issues, the future of computer hardware, software, and professionals

Final Exam

II. Course Objectives*:

A. Acquire and demonstrate core computer programming skills. I, II, III, V, XI
B. Gain a deeper perspective on the field of computing and on themselves. I, III, IV, X, XI
C. Apply deductive logic skills to a variety of problem domains. I, V, XI
D. Understand the real-world demands of a computing career. IX
E. Establish a positive attitude toward lifelong learning. VII, X, XI
F. Learn and apply structured decision making and organizational skills. III, V, XI
G. Become aware of and make use of repeating patterns in thinking, learning, and computing. III, IV, V
H. Discuss ethical problems raised by computer technology and our computer-based society. VII, X
I. Discuss issues of individuality, privacy, computer crime, and the future of computing. II, III
J. Understand how computers can be viewed as a valid medium of artistic expression. XII

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

III. Instructional Processes*:

Students will:

1. Write reports, make at least one class presentation, and maintain a course notebook. *Communications Outcome*
2. Participate in informal aptitude and personality tests, work to deadlines and schedules, and be encouraged to improve study and learning skills. *Personal Development Outcome*
3. Learn and apply structured problem solving and design techniques, apply these skills to novel problem situations, and participate in a team project. *Problem Solving and Decision Making Outcome, Active Learning Strategy*
4. Discuss the impact of, and social issues related to, our computer-based society. *Cultural Diversity and Social Adaptation Outcome, Transitional Strategy*

5. Learn about the hardware implementation of computers and the problems faced by computer programmers, use word processing software to complete reports, discuss computer viruses and computer crime. *Technological Literacy Outcome*

6. Use algebra to solve word problems, use Boolean algebra and truth tables to describe and analyze computer functionality, create and evaluate digital logic circuits. *Numerical Literacy Outcome, Problem Solving and Decision Making Outcome*

Effectively utilize the library and other sources of research to create reports *Information Literacy Outcome*

7. 

8. Perform research on the demands and requirements of their selected field of study and initiate a dialog with a professional working in this field. *Transitional Strategy*

9. Participate in at least one role-playing, gaming, or debate exercise. *Communication Outcome, Active Learning Strategy*

*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. Apply basic algebra skills to word problems. A

2. Perform conversions and manipulation of decimal, binary, and hexadecimal numbers. A

3. Discuss the hardware of components of computers down to the logic gate level. A

4. List the names and contributions of the men and women who played key roles in the development of the modern computer. B

5. Explain the specific course requirements of their current degree program along with the general course requirements of more advanced computer science degrees (AS, BS, MS, PhD). B

6. Apply critical thinking skills toward novel problems presented in class, in lab, and on tests. C

7. Identify typical starting salary ranges and work expectations for their field of interest. D

8. Intelligently discuss their personality, aptitude, and motivation toward computer programming. D

9. Identify and discuss factors impacting upon short-term focus, learning, and retention. E

10. Understand the commitment to lifelong learning that accompanies most career paths in computing. E

11. Discuss personal organization and scheduling techniques. F
12. Create problem decomposition diagrams. F
13. List the steps of a structured problem solving methodology. F
14. Apply problem decomposition, flowcharting, and structured design techniques to a variety of problem areas. G
15. Identify patterns in the way humans think and learn, as well as in the languages humans use to program computers. G
16. Discuss ethical issues raised by the omnipresence of computers in society. H
17. Identify likely future trends in computer hardware and software. I
18. Describe how a computer virus infects other computers. I
19. Discuss the use of computers in the arts. J
20. Discuss computer software development as an artistic expression. J

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

V. Evaluation:

A. Testing Procedures:

There will be four examinations. Each examination will count 100 points. If a test is missed, the final examination will account for 200 points.

B. Laboratory Expectations:

There will be daily exercises to be completed before leaving the lab. These exercises will total 400 points. All lab and homework assignments must be completed and submitted at the expected date and time. There will be a penalty for submitting late assignments.

C. Field Work:

N/A

D. Other Evaluation Methods:

There will be approximately 10 homework essays that will account for a total of 200 points. Students are also required to maintain a course notebook. Failure to do so will result in a final grade of “F” for the course. The instructor may provide additional evaluation information during the first week of class via syllabus supplement.

E. Grading Scale:

<table>
<thead>
<tr>
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<th>Points</th>
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<tbody>
<tr>
<td>Examinations</td>
<td>400</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>400</td>
</tr>
<tr>
<td>Homework</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
</tr>
</tbody>
</table>

Final grades for the course are determined as follows:

900 – 1000        A
860 – 899         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.

B. Academic Dishonesty:

Plagiarism, cheating, software piracy, non-educational use of the computer systems and other forms of academic dishonesty are strictly prohibited. A student caught cheating or infracting specific rules will be given a grade of "F" for the course.