Pellissippi State Community College
Master Syllabus

COMPUTER SCIENCE II
CISP 1020

Class Hours: 3.0  Credit Hours: 4.0
Laboratory Hours: 3.0  Revised: Fall 2017

Catalog Course Description
Advanced problem solving and algorithm development, structured programming, data structures and applications, I/O techniques, lists, queues, trees, algorithms, and files. Program development using UNIX operating system. This course is intended for University Parallel students.

Prerequisite(s)
CISP 1010 or department approval.

Co-requisite(s)
None

Textbooks(s) and Other Course Materials


Week/Unit/Topic Basis

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, Review of C++: I/O, Functions, Arrays, C++ string Objects and C-strings, Structures, Pointers.</td>
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<td>2</td>
<td>Typedef, Structures, Program structure (header files, source files, Makefiles), Pointer arithmetic and double-indirection</td>
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<td>3</td>
<td>Command line arguments. Binary search, Recursion, Stacks as Arrays</td>
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<td>4</td>
<td>Elementary File I/O, Queues, Circular Queues. Unions. Enumerated Types</td>
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<td>5</td>
<td>Dynamic Memory Allocation, Dynamic Linked Lists, Doubly-Linked Lists</td>
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<td>6</td>
<td>C++ Custom classes</td>
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<td>7</td>
<td>C++ Custom classes</td>
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<td>8</td>
<td>Review and Exam</td>
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<td>9</td>
<td>C++ Standard Template Library (STL)</td>
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<td>10</td>
<td>Custom classes, Binary trees, Algorithm Complexity</td>
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</table>
Custom classes, Hashing, Binary Heaps, Priority Queues and Algorithm complexity

Sorting (including recursive quick sort) and Algorithm complexity.

Custom classes and AVL Trees

Review and Exam

Final Exam Period

Course Goals*

The course will

A. Enhance the effective use of advanced C++ programming statements the use of these statements in writing a large program. I, II, III, IV, VI, V
B. Expand student understanding of data abstraction, specification, refinement and implementation
C. Teach students about specific data structures such as lists, stacks, queues, linked-lists, hash tables and binary trees. III, IV, V
D. Help students understand various searching and sorting methods and their efficiency. III, IV, V
E. Require students to use various data structures in writing a large program with C++. I, II, III, IV, V
F. Require students to write well-structured programming code using separate header and source code files. II, III, IV, V
G. Require students to use recursive techniques to solve problems when appropriate. II, V

*Roman numerals after course objectives reference goals of the (enter program here) program.

Expected Student Learning Outcomes*

Students will

1. Apply the syntax and semantics of C++ programming languages. A
2. Utilize advanced C++ programming statements in large programs. A, B, E
3. Construct user-defined data types, arrays, structures and unions. A, B, E
4. Implement and address abstract data structures via pointers. B, C
5. Construct links, stacks, queues, linked-list and binary tree searching, insertion and deletion. C
6. Implement and utilize recursive functions. C, D, G
7. Demonstrate various sorting and searching techniques. D
8. Demonstrate hashing techniques. C
9. Demonstrate the use of heaps. C
10. Demonstrate methods to balance binary search trees. A, C, E
11. Write a large program using various data structures. E, F
12. Write and use make files to manage projects. F

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

A. Testing Procedures: 40% of grade
   At least two tests will be given. Failure to make a passing exam average will result in a
   grade of F for the course.

B. Laboratory Expectations: 40% of grade
   At least 7 labs will be given. Failure to make a passing lab average will result in a grade
   of F for the course.

C. Field Work: 0% of grade

D. Other Evaluation Methods: 20% of grade
   As indicated in the instructor’s syllabus supplement. The remaining 20% of the student
   grade at the discretion of the instructor.

E. Grading Scale
   A  93-100
   B+ 88-92
   B  83-87
   C+ 78-82
   C  73-77
   D  65-72
   F  0-64

Policies

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.

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.

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 (http://www.pstcc.edu/sswd/) may be contacted via Disability Services email or by visiting Alexander 130.