CSE 1284
Introduction to Computer Programming

REQUIRED/ELECTIVE:
   Computer Science – Required
   Software Engineering – Required
   Computer Engineering – Required

CATALOG DATA:
   (Prerequisite: MA 1313) Three hours lecture. Three hours laboratory. Introductory problem
   solving and computer programming using object-oriented techniques. Theoretical and practical
   aspects of programming and problem solving. Designed for CS, CPE, and SE majors.

PREREQUISITE BY TOPIC:
   1. Simple problem solving skills
   2. Basic algebraic equation solutions.

TEXTBOOKS AND OTHER REQUIRED MATERIAL:
   (or similar text)

COORDINATOR:
   Dr. David A. Dampier

COURSE OBJECTIVES:
   1. To introduce principles and practice of software development using the object-oriented
      programming approach.
   2. To introduce develop the problem solving skills necessary to develop software solutions to
      problems.
   3. To develop knowledge of the data and control structures available in the object-oriented
      programming paradigm and their appropriate uses.

TOPICS COVERED:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>(Number of class hrs)</th>
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<tbody>
<tr>
<td>1. Introduction to the course</td>
<td>1</td>
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<tr>
<td>2. Creating a program and compiling a program, case studies</td>
<td>3</td>
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<tr>
<td>3. Data types and operators</td>
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<td>4. Input/output</td>
<td>3</td>
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<tr>
<td>5. Control flow and loops</td>
<td>6</td>
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<td>6. Arrays</td>
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<tr>
<td>a) One dimensional arrays</td>
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<td>b) Search and sorting</td>
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<td>c) Multiple dimension arrays</td>
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<td>7. Functions and program structure</td>
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<td>a) Interactions</td>
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<td>b) Scope</td>
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<td>8. Classes, objects, and methods</td>
<td>6</td>
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<td>9. Software development lifecycle</td>
<td>3</td>
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<td>10. Pointers</td>
<td>3</td>
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<tr>
<td>11. Exams</td>
<td>3</td>
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Laboratory (Number of lab weeks)
1. Lab orientation; familiarization with use of editors, compilers, and debuggers; submission process and grading.  1
2. Basic program structure. Creating and compiling a program.  1
3. Using data types, arithmetic operators, and simple input/output  1
4. Repetition structures  1
5. Selection structures  1
6. More advanced input/output  1
7. Using arrays. Applications with searching and sorting  3
8. Using functions for program structure  2
9. Organizing information and action using classes  2
10. Using pointers  1
11. Software development cycle for larger programs  1

CONTRIBUTION TO PROFESSIONAL COMPONENT:
Engineering Topics of Engineering Science and Design

ASSESSMENTS:
1. Short quizzes in lecture meetings.
2. Examinations
3. Programming Assignments

RELATIONSHIP TO PROGRAM OUTCOMES:
Note: Parenthesized list indicates the ABET criteria, Computer Engineering outcomes, and Software Engineering outcomes addressed by each performance criteria.

Performance Criteria:
1. Demonstrate the ability to use flow control language constructs appropriately to solve a state problem.  (c, e, cpe2, se3, se5)
2. Demonstrate the ability to use single- and multi-dimensional arrays where appropriate to represent repetitive data.  (c, e, cpe2, se3, se5)
3. Demonstrate the ability to decompose problems into modules for solution.  (c, e, cpe2, se3, se5)
4. Demonstrate the ability to pass information between modules in a program appropriately.  (c, e, cpe2, se3, se5)
5. Demonstrate the ability to use standard built-in functions to perform simple tasks.  (c, e, cpe2, se3, se5)

PREPARED BY:
Dr. David A. Dampier, Department of Computer Science & Engineering, March 27, 2005.

ESTIMATE CSAB CATEGORY CONTENT:

<table>
<thead>
<tr>
<th></th>
<th>CORE</th>
<th>ADVANCED</th>
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<th>CORE</th>
<th>ADVANCED</th>
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<tbody>
<tr>
<td>Data Structures</td>
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<td>Computer Organization and Architecture</td>
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<tr>
<td>Algorithms</td>
<td>1</td>
<td></td>
<td>Concepts of Programming Languages</td>
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<tr>
<td>Software Design</td>
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ORAL AND WRITTEN COMMUNICATIONS:

Every student is required to submit at least 8 written reports (not including exams, tests, quizzes, or commented programs) of typically 3-4 pages and to make oral presentations of typically ____ minutes duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.

SOCIAL AND ETHICAL ISSUES:

None.

THEORETICAL CONTENT:

None

PROBLEM ANALYSIS:

Many of the lab assignments requires the students to do analysis of a problem prior to the lab meeting and design a potential solution. They are also required to do post-lab analysis of the results.

SOLUTION DESIGN:

Students are required to design algorithms to solve a variety of problems in the lab assignments.