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January 6, 2006

METROPOLITAN STATE COLLEGE of DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Letters, Arts, and Sciences

Department: Mathematical and Computer Sciences

CIP Code: 11.0701

Prefix & Course Number: CS 1050 Crosslisted With*: _____

Course Title: Computer Science I

Check All That Apply: Required for Major: X Required for Minor: X Specified Elective: X
Required for Concentration: _____ Elective: X Service Course: X

Credit Hours: 4 (4 + 0)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 60 Lab 0 Internship 0 Practicum 0 Other (please specify type and hours): _____

Schedule Type(s): Lecture Grading Mode(s): Letter

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): _____

Prerequisite(s): Permission of Department

Corequisite(s): none

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s): none

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This is the first course in the computer science core sequence. Students will learn a modern programming language and the basic skills needed to analyze problems and construct programs for their solutions. The emphasis of the course is on the techniques of algorithm development, correctness and programming style. Students are also introduced to the fundamentals of software engineering and the software development life cycle.

APPROVED: Ruffi G. Yaras

Department Curriculum Committee

1-17-06

Date

Steve Bosty
Department Chair OR Program Director

1/19/06

Date

Hal Ramsey
Dean OR Associate Dean

1/31/06

Date

Anda S. Clunas
Associate VP, Academic Affairs

2/2/06

Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Required Reading and Other Materials will be equivalent to:

Horstmann, Cay (2006). Java Concepts, 4th edition, Wiley.

Specific, *Measurable* Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Write and run a computer program that correctly solves a problem in the range from simple to medium difficulty.
2. Appropriately document a computer program.
3. Use modularity when writing programs.
4. Declare and define classes, methods, and variables.
5. Declare and utilize parameters and return values.
6. Utilize expressions, assignment, decision structures, and looping.
7. Use appropriate data types including integers, real numbers, characters, Booleans, arrays, and strings.
8. Write interactive programs and programs that use text files for input and output.
9. Utilize the top-down problem solving technique and stepwise refinement.
10. Determine the scope and visibility of an identifier.
11. Utilize testing and debugging techniques.
12. State the basic steps of the software life cycle.

Detailed Outline of Course Content (Major Topics and Subtopics):

- I. Computers and Programs
 - A. overview of computer systems, language translating, and development environments
 - B. algorithms, syntax, semantics, programs and subprograms
- II. Software Engineering
 - A. problem definition
 - B. modularity
 - C. top-down design, step-wise refinement
 - D. object-oriented design, class design
 - E. software documentation
 - F. software engineering life cycle
- III. Testing
 - A. error types and detection
 - B. debugging
 - C. exceptional conditions
- IV. Data Types, Variables, and Identifiers
 - A. integer, real, character, Boolean, string
 - B. finite precision errors
 - C. representation
 - D. scope and visibility
 - E. constants
 - F. operators, expressions, and operator precedence

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- V. Input/Output
 - A. interactive
 - B. reading and writing text files
 - C. recognizing end of file

- VI. Classes
 - A. definitions of classes, methods, and objects
 - B. standard libraries
 - C. method arguments and return values

- VII. Decision Structures
 - A. conditional operators and logical expressions
 - B. if-then else, nested if-then else
 - C. case structures

- VIII. Looping
 - A. while, do while, for loops
 - B. infinite loops

- VIII. Arrays
 - A. one and multi-dimensional arrays
 - B. processing using arrays including partially filled arrays
 - C. searching – linear
 - D. sorting -- selection

Evaluation of Student Performance:

1. Homework and programming assignments
2. Quizzes and examinations
3. Final examination
4. Research papers and/or Book reports
5. Oral presentations

As determined by the instructor. Written communication skills will be applied in this course.