

Curriculum Action Request (CAR) (Form 4-93) - Maui Community College

1. Author(s) Sandra R. Swanson

2. Authors' unit(s) Science, Technology, Engineering, & Mathematics (STEM)

3. Date submitted to Curriculum Committee 15 Sep 2006

4. a. General type of action? course program

b. Specific type of action

Addition

- regular
- experimental
- other (specify) _____

Modification

- number/alpha
- title
- credits
- description ✓
- prerequisites ✓
- corequisites
- program
- other (specify) _____

5. Reason for this curriculum action
 To bring course in systemwide alignment with other UH campuses

6. Existing course

ICS	111	Introduction to Computer Science I	4
alpha	number	title	credits

7. Proposed new/modified course

ICS	111	Introduction to Computer Science I	4
alpha	number	title	credits

8. New course description or page number in catalog of present course description, if unchanged.

Intended for Computer Science majors and all others interested in the first course in programming. An overview of the fundamentals of computer science emphasizing problem solving, algorithm development, implementation, and debugging/testing using an object-oriented programming language.

Meets ACM CS1 course standards. ac

9. Prerequisite(s)
 ICS 110 with at least a "C", and placement at MATH27 or 107, placement at ENG 22 or higher, or consent.

10. Corequisite(s)
 None

11. Recommended preparation

12. Is this course cross-listed? yes no If yes, list course

13. Student contact hours per week. 4

14. Class format (enter one of the following: lecture, lab, lecture/lab, other) _____
If other explain.

Lecture/Laboratory

15. What method of delivery should be used for this course?

- traditional classroom HITS (interactive TV) cable on-line
 any of these other, explain,

16. Revise current MCC General Catalog page(s) 117

17. Course grading letter grade only credit/no credit either audit

18. Proposed semester and year of first offering? Fall semester 2007 year

19. Maximum enrollment 24 Rationale, if applicable

Maximum number of computers in computer laboratory.

20. Special scheduling considerations? yes no
If yes, explain.

Requires availability of appropriately equipped computer laboratory.

21. Special fees required? yes no
If yes, explain.

22. Will this request require special resources (personnel, supplies, etc.?) yes no
If yes, explain.

Computers with Java Software Development Toolkit (SDK) and appropriate programming development environment.

23. Is this course restricted to particular room type? yes no
If yes, explain.

Computers with Java Software Development Toolkit (SDK) and appropriate programming development environment.

24. Course fulfills requirement for ECET _____ program/degree

Course is an elective for Technical elective for ECET _____ program/degree

Course is elective for AA degree

25. This course increases decreases makes no change in number of credit required
for the program(s) affected by this action

26. Is this course taught at another UH campus? yes no

a. If yes, specify campus, course, alpha and number

UHH: CS 150, Introduction to Computer Science
UHM: ICS 111, Introduction to Computer Science I
HonCC: ICS 111, Introduction to Computer Science I
KapCC: ICS 111, Introduction to Computer Science I
KauCC: ICS 111, Introduction to Computer Science I
LeeCC: ICS 111, Introduction to Computer Science I
WinCC: ICS 111, Introduction to Computer Science I

b. If no, explain why this course is offered at MCC

27. a. Course is articulated at

UHCC UH Manoa UH Hilo UH WO Other/PCC

b. Course is appropriate for articulation at

UHCC UH Manoa UH Hilo UH WO Other/PCC

c. Course is not appropriate for articulation at

UHCC UH Manoa UH Hilo UH WO Other/PCC

d. Course articulation information is attached? yes no

Proposed by

 SEP 08 2006
Author or Program Coordinator/Date

Approved by

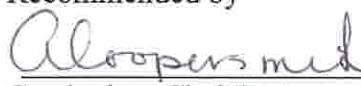
 12/8/06
Academic Senate Chair/Date

Requested by

 SEP 08 2006
Division or Unit Chair/Date

 2/5/07
Chief Academic Officer/Date

Recommended by

 13 Nov 06
Curriculum Chair/Date

 2/5/07
Chancellor/Date

Revised Feb 2005/AC

Revised for automated completion: Apr 2005/ss

**Maui Community College
Course Outline**

1. Alpha and Number ICS 111

Course Title Introduction to Computer Science I

Credits 4

Date of Outline 15 Sep 2006

2. Course Description Intended for Computer Science majors and all others interested in the first course in programming. An overview of the fundamentals of computer science emphasizing problem solving, algorithm development, implementation, and debugging/testing using an object-oriented programming language.

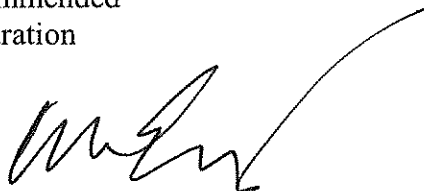
3. Contact Hours/Type 4 cr/hr, Lecture/Laboratory

4. Prerequisites ICS 110 with at least a "C", and placement at MATH27 or 107, placement at ENG 22 or higher, or consent.

Corequisites None

Recommended
Preparation

Approved by _____



Date FEB - 6 2007

5. General Course Objectives

Students will learn the fundamental hardware and software interface and the relationship between hardware and its software instructions. Programming concepts are discussed and their applicability to high level programming languages explored. Basics including data types, flow control, objects, error control, and graphical user interfaces, are introduced.

6. Student Learning Outcomes

For assessment purposes, these are linked to #7. Recommended Course Content.
Upon successful completion of this course students will be able to:

1. Use an appropriate programming environment to design, code, compile, run and debug computer programs.
2. Demonstrate basic problem solving skills: analyzing problems, modeling a problem as a system of objects, creating algorithms, and implementing models and algorithms in an object-oriented computer language (classes, objects, methods with parameters, abstract classes, interfaces, inheritance and polymorphism).
3. Illustrate basic programming concepts such as program flow and syntax of a high-level general purpose language
4. Identify relationships between computer systems, programming and programming languages.
5. Demonstrate working with primitive data types, strings and arrays.

7. Recommended Course Content and Approximate Time Spent on Each Topic *Linked to #6. Student Learning Outcomes.*

1. (1 - 4 weeks) Use an appropriate programming environment to design, code, compile, run and debug computer programs. (1, 2, 3, 4, 5)
 - a. Programming-tools.
 1. Integrated Development Environment (IDE) or a text editor and command line-based compilation and execution.
 - b. Coding a solution.
 1. Self-documenting programs.
 2. Good formatting.
 - c. Compile and run programs.
 - d. Debug programs.
2. (3 - 4 weeks) Demonstrate basic problem solving skills: analyzing problems, modeling a problem as a system of objects, creating algorithms, and implementing models and algorithms in an object-oriented computer language (classes, objects, methods with parameters, abstract classes, interfaces, inheritance and polymorphism). (1, 2, 3, 4, 5)
 - a. Analysis of a problem by identifying objects and classifying them.
 - b. Design a solution to the problem by defining the messages objects send each other, the parameters the messages carry and the inheritance among object classes.
 - c. Classes, objects, and methods.
 - 1) Classes objects, and methods described.
 - a) Classes.
 - b) Objects.
 - c) Method declarations and method calls
 - d) Overloaded methods.
 - 2) Incorporate parameter passing.
 - a) Formal and actual parameters.
 - b) Returning values from methods
 - c) Parameter passing by value and by reference.
 - 3) Write simple classes and objects.
 - a) Classes.

- b) Objects.
 - c) Method declaration/implementation and method calls.
 - d) Constructors.
 - e) Encapsulation through visibility modifiers (public, private)
 - f) Class and instance methods and fields (static)
- 4) Inheritance and Polymorphism
- a) Extending classes, subclasses
 - b) Overriding methods
 - c) Polymorphism
- 5) Interfaces
- a) Interfaces as types
 - b) Implementing by classes
- 6) Program Development
- a) Algorithm design and representation using pseudocode, flowcharts, etc.
 - b) Evaluate algorithm efficiency.
 - c) Stepwise refinement.
 - d) Program lifecycle.
3. (3 - 4- weeks) Illustrate basic programming concepts such as program flow and syntax of a high-level general purpose language. (1, 2, 3, 4, 5)
- a. Sequence.
 - b. Selection.
 - c. Repetition.
4. (1 - 2 weeks) Identify relationships between computer systems, programming and programming languages. (1, 2 ,3, 4, 5)
- a. Computer organization and architecture (memory, arithmetic-logic unit, control unit).
 - b. Binary representation of data (range of data type, precision and round-off, image representation).
 - c. Operating system concepts.
 - d. Programming language assembler/compiler.
5. (1 - 2 weeks) Demonstrate working with primitive data types, strings and arrays. (1, 2, 3, 4, 5)
- a. Primitives Types
 - 1. Numeric, character and boolean types.
 - 2. Numeric accuracy.
 - 3. Memory requirements.
 - 4. Declaration.
 - 5. Initialization.
 - b. Integer Arithmetic
 - 1. Addition and subtraction, increment and decrement
 - 2. Multiplication, division, and modulo.
 - 3. Truncation.
 - c. Casting
 - 1. Type assignment.
 - 2. Implicit and explicit casting.
 - d. Strings
 - 1. Constants
 - 2. Concatenation.
 - e. Arrays
 - 1. Declaration
 - 2. Access to array vs. access to an element
 - 3. Multidimensional arrays

8. Text and Materials, Reference Materials, Auxiliary Materials and Content

Appropriate text(s) and materials, i.e., Java, An Introduction to Problem Solving & Programming, Savitch, Walter, will be chosen at the time the course is to be offered from those currently available in the field.

9. Recommended Course Requirements and Evaluation

Formative and summative assessments: Students may be asked to take written or oral quizzes and examinations to assess their understanding of the various learning outcomes.

25 - 60%: Assignments & programming exercises.

15 - 30%: Examinations.

10 - 25%: Quizzes.

5 - 10%: Class & laboratory participation.

10. Methods of Instruction

Lecture / Discussion / Laboratory.

Assessment of Intended Student Learning Outcomes Standards – CCOWIQs with Ratings for ICS 111

Key:

3 = Major Emphasis: The student is actively involved (uses, reinforces, applies, and evaluated) in the student learning outcomes. The learner outcome is the focus of the class.

2 = Moderate Emphasis: The student uses, reinforces, applies and is evaluated by this learner outcome, but it is not the focus of the class

1 = Minor Emphasis: The student is provided an opportunity to use, reinforce, and apply this learner outcome, but does not get evaluated on this learner outcome

0 = No Emphasis: The student does not address this learner outcome

Standard 1: Written Communication	ICS 111
Write effectively to convey ideas that meet the needs of specific audiences and purposes.	
1.1 Use writing to discover and articulate ideas	3
1.2 Identify and analyze the audience and purpose for any intended communication	1
1.3 Choose language, style and organization appropriate to particular purposes and audiences	2
1.4 Gather information and document sources appropriately	1
1.5 Express a main idea as a thesis, hypothesis, and other appropriate content	0
1.6 Develop a main idea clearly and concisely with appropriate content	1
1.7 Demonstrate mastery of the conventions of writing, including grammar, spelling, and mechanics	2
1.8 Demonstrate proficiency in revision and editing	0
1.9 Develop a personal voice in written communication	0
Standard 2: Quantitative Reasoning	
Synthesize and articulate information using appropriate mathematical methods to solve problems and logically address real-life situations.	
2.1 Apply numeric, graphic and symbolic skills and other forms of quantitative reasoning, accurately and appropriately	3
2.2 Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate	3
2.3 Communicate clearly and concisely the methods and results of quantitative problem solving	3
2.4 Formulate and test hypotheses using numerical experimentation	3
2.5 Define quantitative issues and problems, gather relevant information, analyze that information, and present results	3
2.6 Assess the validity of statistical conclusions	1
Standard 3: Information Retrieval and Technology (Information Literacy)	
Access, evaluate, and utilize information effectively, ethically and responsibly.	
3.1 Use print and electronic information technology ethically and responsibly	2
3.2 Demonstrate knowledge of basic vocabulary, concepts, and operations of information technology and retrieval	1
3.3 Recognize, identify, and define an information need	1
3.4 Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information	1
3.5 Create, manage, organize, and communicate information through electronic media	2
3.6 Recognize changing technologies and make informed choices about their appropriateness and use.	3
Standard 4: Oral Communication	
Practice ethical and responsible oral communications appropriate to a variety of audiences and purposes.	
4.1 Identify and analyze the audience and purpose of any intended communication.	0
4.0 Gather, evaluate, select, and organize information for the communication.	0
4.3 Use language, techniques, and strategies appropriate to the audience and occasion.	0
4.4 Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion	0
4.5 Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.	0
4.6 Use competent oral expression to initiate and sustain discussion.	0
Standard 5: Critical Thinking	
Apply critical reasoning skills to effectively address the challenges and solve problems.	
5.1 Identify and state problems, issues, arguments, and questions contained in a body of information.	3
5.0 Identify and analyze assumptions and underlying points of view relating to an issue or problem.	3
5.3 Formulate research questions that require descriptive and explanatory analyses.	3
5.4 Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.	1
5.5 Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.	3
5.6 Apply problem-solving techniques and skills, including the rules of logic and logical sequence.	3
5.7 Synthesize information from various sources, drawing appropriate conclusions.	1

5.8 Communicate clearly and concisely the methods and results of logical reasoning.	3
5.9 Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.	1