University of Hawaii Community Colleges  
Proposal to Initiate, Modify or Delete a Course

1. Type of Action  
   - A. Addition  
   - B. Deletion  
   - C. Modification:  
     - in credits  
     - in title  
     - in prerequisites or co-requisites  
     - Other (click to specify)

2. New Alpha, Number and Title  
   ICS 211 INTRODUCTION TO COMPUTER SCIENCE II

3. Credits 3 credits

4. Old Alpha, Number and Title

5. Credits *

6. New Catalog Description  
   Reinforce and strengthen problem-solving skills using more advanced features of programming languages and algorithms such as recursion, pointers, and memory management. Emphasize the use of data structures such as arrays, lists, stacks, and queues.

7. Select box and type specific information in text box.  
   - Prerequisites  
   - Corequisites or Recommended Preparation  
   - A grade of "C" or better in ICS 111 or consent of instructor.

8. Student Contact Hours Per Week  
   Lecture 3  
   Lab Other (click to specify)

9. Proposed Date of First Offering  
   Semester Spring  
   Year 2011

10. This course  
    - is proposed for the * Program.  
    - can fulfill * If Other, specify

11. This course  
    Makes No Difference in the number of credits required for the program/core.

12. Equivalent or similar courses offered in the UH System:

<table>
<thead>
<tr>
<th>Campus</th>
<th>Alpha, Number, Title</th>
<th>Campus</th>
<th>Alpha, Number, Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH Manoa</td>
<td>ICS 211 INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>UH Hilo</td>
<td>ICS 211 INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>KapiolaniCC</td>
<td>ICS 211 INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
| HonoluluCC      | ICS 211 INTRODUCTION TO COMPUTER SCIENCE II | * | *
| *               | *                   | *               | *                   |

13. This course is (check one and click in appropriate textbox and provide details):  
   - Already articulated with  
   - Provide details of existing or desired articulation (date, college(s), purposes, pre-major, etc.) in this space:  
   - Appropriate for Articulation with UH Hilo and UH Manoa  
   - Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.) in this space:  
   ICS-211 is not appropriate for articulation with the UHM general education core but does articulate with degree requirements for the baccalaureate degrees offered by the ICS department at UHM and UH-Hilo. The current articulation agreement is dated 11/22/05 and effective fall 2007.  
   - Not yet appropriate for Articulation.

14. Reason for Initiating, Modifying or Deleting Courses or Other Pertinent Comment:  
   To offer more ICS transfer courses to the WCC students and to encourage more students to pursue the ICS degree at UH Manoa and UH Hilo. Offering this course will encourage STEM course enrollment which is WCC Strategic Plan objective four.

Requested by:  
Approved by:  

CCCMM 6100 (Amended for WCC use October 2002)
Levels of Review of Course Proposal at Windward Community College

Course Alpha, Number, and Title:

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-18-2010</td>
</tr>
<tr>
<td></td>
<td>2/18/2010</td>
</tr>
</tbody>
</table>

1. Department Area (more than one departmental instructor’s signature required)

   [Signatures]

   2-18-2010

2. Department

   [Signature]

   Department Chairperson

   Was this course discussed in a department meeting? [ ] Yes [ ] No

   2-18-2010

3. Division

   [Signature]

   03/02/10

4. Curriculum Committee Review

   Approved [ ]

   Disapproved [ ]

   Reason:

   [Signature]

   Curriculum Committee Chairperson

   4/1/10

CCCM #6100 (Amended for WCC use October 2002)
1. How is this course related to the education needs and goals of the College/Department/Community as reflected in the EDP/ADP?

The following WCC Strategic Outcomes are met:
Community College Action Outcome 2.4 Increase by 3% the number of students who successfully progress and graduate (4,181 degrees by 2015), or transfer to baccalaureate institutions,
2.7 Increase the number of transfers to UH System and non-system baccalaureate institutions
4.1 Increase by 3% per year the number of degrees awarded, and/or transfers to UH baccalaureate programs that lead to occupations where there is a demonstrated state shortage of qualified workers and where the average wage is at or above the U.S. average ($38,651 YR 2006).
4.3 Increase by 3% per year the number of degrees and certificates awarded in Science, Technology, Engineering, and Math (STEM) fields.
4.3 Expand the curriculum that prepares students for nursing, social work, information technology, and other critical workforce shortage areas by adding at least one new course per year.
4.5 Promote the knowledge, skills, and opportunities that support current and emerging STEM fields and careers by increasing credit and noncredit STEM course enrollments by 3% per year.
4.6 Increase the number of degrees awarded, and/or transfers to UH baccalaureate programs that lead to occupations where there is a demonstrated state shortage of qualified workers and where the average wage is at or above the U.S. average ($38,651 YR 2006) by 3% per year.

2. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial support that would be required to implement this course. (Include an estimate of the actual cost of supplies and equipment.) What has been done to provide for these additional costs for the proposed date of offering? Who will teach the course?

Staff

3. Is a similar course taught elsewhere in the UH system? Yes If yes, provide details of how this course differs from existing similar courses.

It is the same course

4. Is this course experimental and/or unique to Windward Community College? No If yes, provide rationale and details of its impact on the College Curriculum

5. Is a similar course taught in the upper division level by a 4-year UH college? Yes If yes, explain why this course is appropriate at the lower division or how it differs from its upper division counterpart. This course is taught at all other Oahu CC campuses.

6. Please attach a complete course outline. Your course outline should address all the items listed in the Guidelines for Course Outlines.

7. If this course is numbered 100 or above or appropriate for transfer to a 4-year college, complete and attach WCC Form for Transfer Courses (blue). See criteria for transfer courses.
Course Alpha and Number ICS 211 INTRODUCTION TO COMPUTER SCIENCE II

Submitted by Peggy Regentine

Date March 31, 2010

1. List the counterpart to this course on any 4-year UH campus. Describe the relationship between the course any related baccalaureate program area.

   ICS 211 INTRODUCTION TO COMPUTER SCIENCE II

2. Is this course taught or accepted by major accredited colleges or universities? Give one or two examples.

   UH and UH Hilo

3. Please attach a complete course outline if you have not done so already. Your course outline should address all the items listed in the Guidelines for Course Outlines.
Proposal to Initiate, Modify or Delete a Course Articulation with 4-year UH Campus Form

COURSE ARTICULATION FORM (GENERAL EDUCATION CORE)

ORIGINATING CAMPUS: Windward Community College DATE SUBMITTED: March 31, 2010

COURSE ALPHA & NUMBER: ICS 211 SEMESTER CREDITS: 3

COURSE TITLE: Introduction to Computer Science II

ICS-211 is not appropriate for articulation with the UHM general education core but does articulate with degree requirements for the baccalaureate degrees offered by the ICS department at UHM and UH-Hilo. The current articulation agreement is dated 11/22/05 and effective fall 2007. The course will not be taught until Spring 2011. Submitted by Peggy Regentine

DATE OF OUTLINE: March 31, 2010 Year 2010

(** Representative outline, no multiple syllabi, please.)

1. Articulation committee to review this course:

   Standing Committees
   Written Communication
   Mathematical & Logical Thinking
   World Civilizations
   Languages
   Arts & Humanities
   Natural Science
   Social Science

2. The information in this item is required by the reviewing committee so that it has a starting point for reviewing the course. It is the responsibility of the submitting campus to do the necessary research to provide this information.

In the opinion of the originating campus, this course is equivalent to the following and/or meets the criteria for the indicated core categories. Every core category space, except your own campus, must be filled in (can include ‘none’). An equivalent course, if known, may be helpful to committee members but is not required.

<table>
<thead>
<tr>
<th>Receiving Campus</th>
<th>Equivalent Course (Alpha and Number)</th>
<th>Core Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH Hilo</td>
<td>ICS 211</td>
<td>ICS Degree @UH &amp; UH Hilo</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>ICS 211</td>
<td>ICS Degree @ UH &amp; UH Hilo</td>
</tr>
<tr>
<td>UH West Oahu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaii CC</td>
<td></td>
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</tr>
<tr>
<td>Honolulu CC</td>
<td>ICS 211</td>
<td>ICS Degree @ UH &amp; UH Hilo</td>
</tr>
<tr>
<td>Kapiolani CC</td>
<td>ICS 211</td>
<td>ICS Degree @ UH &amp; UH Hilo</td>
</tr>
<tr>
<td>Kauai CC</td>
<td></td>
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<tr>
<td>Leeward CC</td>
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<tr>
<td>Maui CC</td>
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<tr>
<td>Windward CC</td>
<td></td>
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</tr>
</tbody>
</table>

3. If submitted electronically, I understand that this outline will be posted to a publicly accessible web site to enable open access for reviewing committees and campuses. The outline will be taken off the site upon completion of the review.

Typed Name or Signature

Note: UCA Clearinghouse
John Muth, Office of the Chancellor for Community Colleges, is acting as staff to the University Council on Articulation and is responsible for tracking all courses submitted for articulation.

Revised 1/29/2001
ICS 211 INTRODUCTION TO COMPUTER SCIENCE II
3 credits

INSTRUCTOR:
OFFICE:
OFFICE HOURS:
TELEPHONE:
EFFECTIVE DATE: Spring 2011

Windward Community College Mission Statement

Windward Community College is committed to excellence in the liberal arts and career development; we support and challenge individuals to develop skills, fulfill their potential, enrich their lives, and become contributing, culturally aware members of our community.

CATALOG DESCRIPTION

Reinforce and strengthen problem-solving skills using more advanced features of programming languages and algorithms such as recursion, pointers, and memory management. Emphasize the use of data structures such as arrays, lists, stacks, and queues.

Prerequisites: A grade of "C" or better in ICS 111 or consent of instructor.

This course is a required course for the B.A. and B.S. in ICS degrees at UH-Manoa and UH-Hilo. All of these are approved programs.

STUDENT LEARNING OUTCOMES

The student learning outcomes for the course are:

1. Recognize the use of arrays, lists, stacks, queues, and other data structures.

2. Select the appropriate searching or sorting algorithm based on the algorithm’s behavior.

3. Develop recursive algorithms and programs.

4. Select appropriate data structure for a given application.

5. Use advanced object-oriented programming techniques (polymorphism, inheritance, and encapsulation) and standard libraries.

6. Produce robust programs using exception handling and extensive program testing.

7. Create simple graphical user interface (GUI) program.
COURSE CONTENT

Concepts

1. Recognize the use of arrays, lists, stacks, queues, and other data structures.
   a. Sorting algorithm based on the algorithm’s behavior.
   b. Characterization of data types.
   c. Data types in program control and corresponding potential pitfalls.
   d. Data structures used (classes and built-in classes/libraries).
2. Select the appropriate searching or sorting algorithm based on the algorithm’s behavior.
   a. Sorting algorithms (e.g.: selection sort, insertion sort, bubble sort, quick sort).
   b. Searching algorithms (sequential vs. binary).
3. Develop recursive algorithms and programs.
   a. Recursion concept.
   b. Recursion implementation
   c. Iterative vs. recursive efficiency.
4. Select appropriate data structure for a given application.
   a. Performance characteristics of array and linked implementations.
   b. Problem characteristics to determine whether array, list, stack, or queue provides
      the best representation.
5. Use advanced object-oriented programming techniques such as inheritance and
   standard libraries.
   a. Inheritance.
   b. Standard libraries.
   c. Library organization.
6. Produce robust programs using exception handling and extensive program testing.
   a. Exception handling.
   b. Program testing techniques.
   c. Testing design strategies.
   d. Defensive programming.

COURSE TASKS

Students must independently complete reading assignments, class exercises, homework
assignments and programming projects.

ASSESSMENT TASKS AND GRADING

The requirements for this course consist of eight programming projects, three exams, and
assigned readings from the required texts. Exams will contain a written and hands-on section. A
student must achieve at least 60% on each exam to pass the course.
POUTS

The assignment of points may vary slightly each semester but the following is typical:

<table>
<thead>
<tr>
<th>Projects</th>
<th>25 points</th>
<th>200 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>50 points</td>
<td>150 points</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>350 points</td>
</tr>
</tbody>
</table>

The letter grade for the course will be given as follows:

- A: 90 - 100% of possible points
- B: 80 - 89% of possible points
- C: 70 - 79% of possible points
- D: 60 - 69% of possible points
- F: Below 60% of possible points

LEARNING RESOURCES AND MATERIALS

Text: "Java Software Structures" by John Lewis and John Chase.

Supplies: Storage Media – flash drive.