Curriculum Action Request (CAR) Form
COURSE (New Course, Course Modification, Five Year Review)
University of Hawai'i Maui College

Curriculum Proposal # 2015.30
(for CURCOM use only)

1. Curriculum Action

☑ New Course ☐ Course Modification ☐ Five Year Review

2. Proposer

Debasisb and Dan Kruse

3. Department

☐ Allied Health ☐ Business & Hospitality ☐ Career & Tech Education
☐ English ☐ Humanities ☐ Social Science
☑ Science/Tech/Eng/Math

4. Course Alpha

ICS

5. Course Number

212

6. Course Title

PROGRAM STRUCTURE

7. If this is a course modification or a five year review, please check the curriculum items being modified.

☐ 1. Course Alpha ☐ 2. Course Number ☐ 3. Course Title
☐ 4. Credits ☐ 5. Contact Hours ☐ 6. Course Description
☐ 7. Prerequisites ☐ 8. Corequisites ☐ 9. Rec Prep
☐ 10. Cross-list w other course ☐ 13. Grading Method ☐ 14. Repeatable for credit?
☐ 15. SLOs ☐ 16. Course Competencies ☐ 17. Content & Timeline
☐ 18. PLOs ☐ 19. CASLOs ☐ 21. Method of Delivery
☐ 22. Text and Materials ☐ 23. Maximum Enrollment ☐ 29. Course Designation
☐ 31. Catalog Modification
☐ Other

8. Proposed Semester

Fall 2015

9. Effective Semester (1 Year from Proposed Semester)

Fall 2016

University of Hawaii Maui College
ICS 212 - PROGRAM STRUCTURE

1. **Course Alpha.**

   ICS

2. **Course Number.**

   212

3. **Course Title/Catalog Title.**

   PROGRAM STRUCTURE

4. **Number of Credits.**

   3

5. **Contact Hours/Type.**

   - Hour lecture (3)

6. **Course Description.**

   Focuses on organization paradigms, programming environments, implementation of a module from specifications, the C and C++ programming languages.

7. **Pre-Requisites.**

   ICS 211 with grade C or better, or consent

8. **Co-requisites.**

   None

9. **Recommended Preparation.**

   None

10. **Is this a cross-listed course?**

    NO

11. **Reason for Proposal. Why is this course being proposed or modified? This question requires specific information as part of the explanation.**

    New course at UHMC based on identical course at LCC. Course required for new ICT concentration in ASNS degree. Course is identical to ICS 212 taught at LCC and also part of their ICT concentration for the ASNS degree. Similar course is taught at other UHCC campus location, such as KCC.

12. **Effective Semester and Year.**

    Fall 2016

13. Grading Method. What grading methods may be used for this course?

- Standard (Letter,Cr/NCr,Audit) (0)

14. Is this course repeatable for credit? How often can this course be counted toward a degree or certificate?

NO

15. Course Student Learning Outcomes (SLOs).

Course SLO/Competency	Create properly structured and functional programs that compile correctly.	Develop program structures such as recursion, arrays, pointers, character variables and others.	Determine an optimal use of classes and their properties (inheritance, polymorphism and overloading).	Develop a plan to test programs for their syntax and logic	Develop a design and specification of the program that outlines its goals and objectives
Develop properly structured multifile programs with automatic compilation.	☑			☑	☑
Implement recursion, arrays, pointers, character variables, bitwise operators, structures, and linked data structures in C.		☑			
Use classes (constructors, destructor, and overloading assignment), operator overloading, inheritance, polymorphism, and linked data structures in C++.			☑		
Use standard C++ strings and C++ STL library data structures, such as STL lists.			☑		

Course SLO/PSLO	Explain the natural and technological world using reflection and quantitative analysis including preparation of a plan to collect, process, and interpret data; evaluation of the plan, procedures, and findings; and communication of the conclusions.	Explain scientific knowledge and understanding to different audiences for a range of purposes	Apply scientific knowledge, skills, and understandings to problems and issues in daily life.
Develop properly structured multifile programs with automatic compilation.		☑	☑
Implement recursion, arrays, pointers, character variables, bitwise operators, structures, and linked data structures in C.	☑	☑	
Use classes (constructors, destructor, and overloading assignment), operator overloading, inheritance, polymorphism, and linked data structures in C++.	☑	☑	
Use standard C++ strings and C++ STL library data structures, such as STL lists.	☑		

16. Course Competencies.

Competency
Create properly structured and functional programs that compile correctly.
Develop program structures such as recursion, arrays, pointers, character variables and others.
Determine an optimal use of classes and their properties (inheritance, polymorphism and overloading).
Develop a plan to test programs for their syntax and logic
Develop a design and specification of the program that outlines its goals and objectives

17. Recommended Course Content and Timeline. The course content facilitates the course competencies. Course content may be organized by weeks, units, topics or the like.

Topics covered:

- Introduction to the C programming language -- data types, conditional & looping structures, functions, arrays and pointers (25%)
- Other C language features -- character & string processing, formatted I/O, file processing, and the preprocessor (15%)
- Data Structures in the C programming language (20%)
- Programming in C++ -- classes, operator overloading, inheritance, polymorphism, templates and exception handling (40%)

This course covers all topics normally included in a course in computer programming in C and C++, as evidenced by all available texts in computer programming, and the topics covered by other college-level advanced programming courses, according to college catalogs and review of course outlines (e.g., UH Manoa, and Kapi'olani CC.) The course covers all topics required for writing elementary and intermediate level programs in C and C++. Individual course outlines, handouts, exercises, assignments and readings indicate the breadth and depth of the course.

Evidence that the course reflects current theory and practice in computer programming is gained by comparing the course outlines with those for ICS 212 at Kapi'olani CC and at UH Manoa. Evidence can also be found in the continuous use of textbooks which reflect notions of currency by experts in the field. Evidence is also found by comparing detailed lessons used over the past five years and noting revision to reflect current theory and practice in the field.

18. Program Learning Outcomes.

Program SLO
Explain the natural and technological world using reflection and quantitative analysis including preparation of a plan to collect, process, and interpret data; evaluation of the plan, procedures, and findings; and communication of the conclusions.
Explain scientific knowledge and understanding to different audiences for a range of purposes
Apply scientific knowledge, skills, and understandings to problems and issues in daily life.

19. College-wide Academic Student Learning Outcomes (CASLOs).

☑	**Creativity** - Able to express originality through a variety of forms. ☑ Level 2
☑	**Critical Thinking** - Apply critical thinking skills to effectively address the challenges and solve problems. ☑ Level 2
☑	**Information Retrieval and Technology** - Access, evaluate, and utilize information effectively, ethically, and responsibly. ☑ Level 2
	Oral Communication - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.
☑	**Quantitative Reasoning** - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately. ☑ Level 2
	Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

20. Linking.

21. Method(s) of delivery appropriate for this course.

- Cable TV (0)
- Classroom/Lab (0)
- HITS/Interactive TV (0)
- Hybrid (0)
- Online (0)

22. Text and Materials, Reference Materials, and Auxiliary Materials.

Yes, a college-level textbook is required, such as:

C How to Program, 6th or 7th Edition, Paul Deitel and Harvey Deitel.

23. Maximum enrollment.

35

24. Particular room type requirement. Is this course restricted to particular room type?

YES
Computer classroom required.

25. Special scheduling considerations. Are there special scheduling considerations for this course?

NO

26. Are special or additional resources needed for this course?

No

27. Does this course require special fees to be paid for by students?

NO

28. Does this course change the number of required credit hours in a degree or certificate?

No.

29. Course designation(s) for the Liberal Arts A.A. degree and/or for the college's other associate degrees.

Degree	Program	Category
Associate in Arts:	Liberal Arts	LE - Elective
AS:	ECET - All	PE - Program Elective
AAS:	Bus. Tech. - Information Processing	PE - Program Elective
BAS:	BAS - All	PE - Specialization/Program Electives
Developmental/Remedial:	N/A	

30. Course designation(s) for other colleges in the UH system.

Yes, this course is articulated at UH Manoa. This is a new course at UHMC, but is identical to the same course taught at all UH locations.

It is identical in content at every institution in the UH System that teaches it. This is enforced by a system-wide articulation agreement dated October 3rd, 2014.

31. Indicate the year and page # of UHMC catalog referred to. For new or modified courses, please indicate the catalog pages that need to be modified and provide a sheet outlining those changes.

UHMC General Catalog 2015-2016. Modifications needed for the following:

Page 23 need to insert course in ASNS ICT Concentration

Page 126-127 need to insert course description in ICS list

32. College-wide Academic Student Learner Outcomes (CASLOs).

Standard 1 - Written Communication Write effectively to convey ideas that meet the needs of specific audiences and purposes.	
Outcome 1.1 - Use writing to discover and articulate ideas.	1
Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.	1
Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.	1
Outcome 1.4 - Gather information and document sources appropriately.	1
Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.	1
Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.	1
Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.	1
Outcome 1.8 - Demonstrate proficiency in revision and editing.	1
Outcome 1.9 - Develop a personal voice in written communication.	1
Standard 2 - Quantitative Reasoning Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately.	
Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.	3
Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.	3
Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.	3
Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.	3
Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present results.	3
Outcome 2.6 - Assess the validity of statistical conclusions.	3
Standard 3 - Information Retrieval and Technology. Access, evaluate, and utilize information effectively, ethically, and responsibly.	
Outcome 3.1 - Use print and electronic information technology ethically and responsibly.	2
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.	2
Outcome 3.3 - Recognize, identify, and define an information need.	2
Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.	2
Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.	2
Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.	2
Standard 4 - Oral Communication Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.	
Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.	1
Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.	1
Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.	1
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.	1
Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.	1

Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.	1
Standard 5 - Critical Thinking Apply critical thinking skills to effectively address the challenges and solve problems.	
Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.	2
Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.	2
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.	2
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.	2
Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.	2
Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.	2
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.	2
Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.	2
Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.	2
Standard 6 - Creativity Able to express originality through a variety of forms.	
Outcome 6.1: Generate responses to problems and challenges through intuition and non-linear thinking.	2
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.	2
Outcome 6.3: Sustain engagement in activities without a preconceived purpose.	2
Outcome 6.4: Apply creative principles to discover and express new ideas.	2
Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction	2
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.	2

33. Additional Information