Allan Hancock College Program Review
2015-16 **Annual Update**

Program and Department:	Computer Science, Mathematical Sciences
Date submitted:	4/11/2016
Submitted by:	Michael Wagner

SLOS report update X Revised Plan of Action X

The Annual Update is conducted by all programs at the college and consists of an analysis of changes affecting the program as well as significant new funding needs for staff, resources, facilities, and equipment. It should be submitted or renewed every year by the end of the second week in April in anticipation of budget planning for the following year, which begins at the planning retreat in November. *Note that if there is no change from the previous year, you may simply resubmit the information in that report (or any portion that remains unchanged) from the prior year.

Programs and units should support their planning efforts with quantifiable data, conduct appropriate analyses, and make supportable conclusions. For your use, standardized IT data reports will be provided and sent to departments under separate cover. You may also report on your own internally-generated data. Labor market data is required for all vocational programs at least every two years.

Place your responses in the expandable text boxes below each question.

I. Program Mission (must align with college mission)

Describe the need that is met by the program or the purpose of the program. (Sample: *The Health, Physical Education, and Recreation Division is committed to providing excellent education opportunities to our students for their affective, cognitive and psychomotor development as they pursue sport, recreation, physical education, health education and wellness. We will encourage our students to further and sustain their individual endeavors toward the regular, lifelong pursuit of physical activity and a healthy lifestyle.)* In addition, for vocational programs only, data must show need and that "the program does not represent an unnecessary duplication of other vocational or occupational training programs in the area."

The Computer Science Program is contained in the Mathematical Sciences Department. The program provides quality educational opportunities that enhance student learning and that enable students to reach their educational, occupational, and/or personal goals. The objectives of the courses in the program are to:

- Provide lower division courses for transfer to a four-year university.
- Provide courses for student to meet their vocational/technical degree goals.
- Provide skill training in the foundations of computing and of software programming of computer systems.

All of these objectives meet the mission of the institution. The mission of the institution is to provide members of the community quality educational opportunities that enhance student learning and enhance the creative intellectual, cultural, and economic vitality of the community at large.

II. Progress on Comprehensive Program Review Final Plan of Action

Review the final plan of action (post validation) from the last comprehensive program review and any previous annual updates. Summarize the progress the program has made on recommendations targeted for this last year as well as any outstanding or incomplete items from previous years. What is the status of these recommendations? Include the original target date, action taken and results, and reasons for any changes.

Get the CS program approved for the TMC	All four of the core CS **courses** have been approved against the TMC. After physics and calculus reduce their unit counts, our articulation officer will be sending the **program** over for approval.
Hire a part-time instructor	This was completed. We now have Carl Reinwald regularly teaching CS131.
Assess all computer science learning outcomes.	All courses have had a SLO assessed. Further, nearly all SLOs have been assessed: two SLOs for CS161 needs assessment, and one SLO for CS181 needs assessment.

III. Program SLOs/Assessment

☐ Check here if any SLO's have changed since the last comprehensive program review and/or update.

What are your program student learning outcomes? Which of these have been assessed since the last comprehensive program review and/or update? How are they measured? What did the assessment data indicate about the strengths and weaknesses of your program? What changes have you made/do you plan based on these data? (You should report assessment information on page 4.)

Computer Science Program Learning Outcomes

1. Recall significant computer science concepts, vocabulary and theories.
2. Produce elementary programming projects in a variety of languages.
3. Demonstrate the ability to follow instructions.
4. Find and correct programming errors

All course SLOs have been mapped to program SLOs (SLOs can be found on the attached pages). A program SLOs is achieved if the supporting courses' SLOs' assessments indicate an average rating of 2 ("meeting standard") or above over a six-year program review period. After six years of course SLO data assessment, the program SLO assessment will be completed.

IV. Course SLOs/Assessment

☐ Check here if any SLO's have changed since the last comprehensive program review and/or update.

What are your course student learning outcomes? Which of these has been assessed since the last comprehensive program review and/or update? How are they measured? What did the assessment data indicated about the strengths and weaknesses of your program? What changes have you made/do you plan based on these data? (You should report assessment information on page 4.)

Computer Science Course Student Learning Outcomes

CS102

1. Use basic terms applicable to computer systems appropriately.
2. Develop simple static HTML web pages.

3. Describe some of the major historical events related to computing.

CS111

1. Demonstrate the ability to solve simple problems and express solutions as algorithms.
2. Use fundamental programming constructs in a high level language.
3. Find and correct simple bugs.

CS112

1. Use Object-Oriented principles to model programming problems.
2. Discuss the tradeoffs of basic data structures.
3. Use recursion to solve programming problems.

CS131

1. Perform arithmetic operations on binary numbers.
2. Create schematic diagrams that implement a truth table.
3. Solve problems using assembly programming.

CS161

1. Use graph theory to model basic problems in computer science.
2. Evaluate expressions that are common in fundamental computer science theory.
3. Use proof by contradiction and mathematical induction to prove a variety of simple theorems.

CS175

1. Use Object-Oriented principles to model programming problems.
2. Discuss the tradeoffs between various search and sort algorithms.
3. Use dynamic memory appropriately.

CS181

1. Describe the common components of a game loop.
2. Create simple 2D video games that use graphics, sound, and user input.
3. Develop classes to model game elements.

CS199 (Note: will not be assessed unless a student
does an independent project)

1. Demonstrate the ability to work independently and to follow directions.
2. Develop a plan to solve a given problem.
3. Analyze and articulate the concepts and alternate solutions (where appropriate) to a given problem.

See attached for status.

V. Internal/External Conditions

What external conditions have influenced the program in the past year? Have there been disciplinary or regulatory changes, changes in technology, advisory board recommendations, employer, or accreditation recommendations, demographics, labor market analyses, articulation changes, etc.? Summarize the major trends, challenges, and opportunities that have emerged in the program since the last comprehensive program review and /or annual update.

TMC

The TMC transfer degree for computer science in nearly complete. The blocker, for years, has been that the required calculus and physics classes are 5 units. This put the CS transfer degree over on the max units. Both of those disciplines are working to reduce their unit counts. After this is complete, the articulation officer will be completing the transfer degree's paperwork, and getting approval.

New Instructors

The CS program now has two, regular part-time instructors: Carl Reinwald and Chris Pavone. Carl teaches the low-level, assembly programming class CS131 (computer organization). Chris teachers the high-level, computer science math class CS161 (discrete structures). This step was very important for the CS program. It allows us to regularly offer both of those courses. Our enrollment is continuing its steady increase.

Course changes

CS175 was dropped because its content overlapped too much with the CS112 courses. Further, CS175 isn't a prominent transfer requirement while CS112 is.

What internal conditions that have influenced the program in the past year? What are the program success and retention rates? (Include certification exam rates, if appropriate.) Degrees and certificates awarded? Have there been trends in SLOs/assessment or IT data; changes in technology, budget, staffing or resources; enrollment management or facilities issues; etc.?

We have more students than ever before. See the picture below.

Multi Year Display Demographics

Term: (Multiple values) | subject_co: CS | course: (All) | Credit Status: (Multiple values) | Ethnicity or Age: Ethnicity | Gender or Enrollment Status: Gender

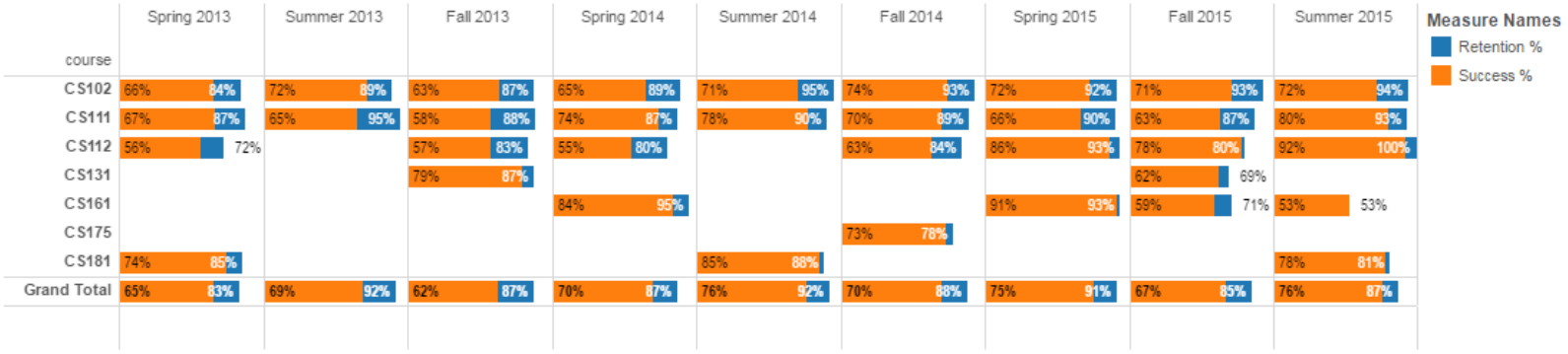
ETHNICITY: (Multiple values) | Gender: (All) | age_category: (All) | Enrollment Status: (All)

*Use two filters above to choose between displaying the four demographic

	Spring 2013		Summer 2013		Fall 2013		Spring 2014		Summer 2014		Fall 2014		Spring 2015		Summer 2015		Fall 2015	
ETHNICITY	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
Asian	11.0	1.4	10.0	1.2	15.0	2.0	16.0	2.2	6.0	0.7	9.0	1.4	14.0	1.7	10.0	1.1	17.0	2.2
Black	3.0	0.3	3.0	0.3	6.0	0.7	4.0	0.5	2.0	0.2	8.0	0.9	8.0	1.0	1.0	0.1	5.0	0.5
Filipono	7.0	1.2	3.0	0.4	5.0	0.7	12.0	1.8	6.0	0.6	10.0	1.3	11.0	1.4	5.0	0.5	15.0	2.3
Hispanic	82.0	11.0	40.0	4.6	93.0	12.8	93.0	12.3	59.0	6.4	102.0	13.9	109.0	14.4	66.0	7.8	147.0	19.1
Native Am	4.0	0.5			1.0	0.1	3.0	0.4	4.0	0.5	8.0	1.1	6.0	0.7	4.0	0.5	9.0	1.0
Pacific Islander	3.0	0.4			1.0	0.1	4.0	0.5			7.0	0.8	4.0	0.5	3.0	0.4	3.0	0.4
White	100.0	12.5	50.0	5.5	104.0	14.8	118.0	15.6	62.0	6.6	112.0	14.9	105.0	14.1	41.0	5.2	109.0	14.4

	Spring 2013		Summer 2013		Fall 2013		Spring 2014		Summer 2014		Fall 2014		Spring 2015		Summer 2015		Fall 2015	
Gender	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
Female	39.0	4.7	34.0	3.7	37.0	4.6	47.0	5.9	36.0	3.8	43.0	5.4	44.0	5.5	26.0	3.0	54.0	6.7
Male	171.0	22.7	72.0	8.3	188.0	26.8	203.0	27.5	103.0	11.2	213.0	29.0	212.0	28.1	103.0	12.4	250.0	33.1
Unknown													1.0	0.1	1.0	0.2	1.0	0.1
Grand Total	210.0	27.4	106.0	12.0	225.0	31.4	250.0	33.4	139.0	15.0	256.0	34.4	257.0	33.8	130.0	15.6	305.0	39.9

Spring 2013, Summer 2013, Fall 2013 and 6 more Retention & Success CS



VIa. Update to Final Action Plan

If you change or modify a previous recommendation, provide an explanation for the change and a new target date. For new recommendations, provide target dates and data for support. For all items, show how they are related to assessment results where possible and provide approximate costs for resources requested. Resources may include budget, facilities, staffing, research support, professional development, marketing, etc. Not all recommendations will require resources. (Plan may cover period up to the next scheduled comprehensive program review.)

There is one addition. See below.

2015-16 PROGRAM REVIEW
VIb. Revised - Plan of Action (Annual Update)

During the academic year, 2010 , 2011 completed program review. The self-study and validation teams developed a final plan of action-post validation based on information in the self study and the recommendations of the validation team.

(If any plan was made and action not taken, please state the rationale for not pursuing that particular item. If action was delayed or postponed, provide an explanation and a new target date.)

CHANGES AND MODIFICATIONS

PLAN OF ACTION	ACTION TAKEN, RESULT AND STATUS
Find a part-time computer science instructor	Fall 2015 - Completed

ADDITIONS

PLAN OF ACTION	TARGET DATE
Determine the tradeoffs of making it so CS111 and CS112 use the same programming language and textbook. (This requires changing all course material).	Fall 2016

RESOURCES NEEDED **(**Be sure there is sufficient justification and data contained in the narrative to support each of the items on your list.)

TYPE OF RESOURCE	LINE NO./SPECIFIC RESOURCE	APPROXIMATE COST
Facility Needs	Current resources are acceptable. No requests.	
Technology Needs	Current resources are acceptable. No requests.	
Staffing Needs	Current resources are acceptable. No requests.	
Equipment (non-technology)	Current resources are acceptable. No requests.	
Other Resources		

Program Review SLOs Report **Annual Update**	**Program:_Computer Science___**	page _____of _____

Use one row for each course or program SLO

SLO	Semester conducted	Assessment collection process	Assessment method (s)	Review team	Date review completed	Recommendations for additional resources needed, staffing, program changes**
CS102 SLO 1	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS102 SLO 2	Fall 2011	Assignment	Score for technical competency.	Wagner	Fall 2011	None
CS102 SLO 3	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS111 SLO 1	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS111 SLO 2	Fall 2011	Assignment	Score for technical competency.	Wagner	Fall 2011	None
CS111 SLO 3	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS112 SLO 1	Fall 2011	Assignment	Score for technical competency.	Wagner	Fall 2011	None
CS112 SLO 2	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS112 SLO 3	Fall 2015	Assignment	Score for technical competency.	Wagner	Spring 2016	None
CS131 SLO 1	Fall 2015	Assignment	Score for technical competency.	Reinwald	Fall 2015	None
CS131 SLO 2	Fall 2015	Assignment	Score for technical competency.	Reinwald	Fall 2015	None

CS131 SLO 3	Fall 2013	Assignment	Score for technical competency.	Wagner	Fall 2013	None
CS161 SLO 1	Spr 2014	Assignment	Score for technical competency.	Wagner	Spr 2014	None
CS161 SLO 2				Pavone		
CS161 SLO 3				Pavone		
~~CS175 SLO 1~~	**Course removed**	~~Assignment~~	~~Score for technical competency.~~	~~Wagner~~	~~Fall 2011~~	~~None~~
~~CS175 SLO 2~~	**Course removed**					
~~CS175 SLO 3~~	**Course removed**					
CS181 SLO 1			Score for technical competency.	Wagner		None
CS181 SLO 2	Spr 2012	Final project	Score for technical competency.	Wagner	Spr 2012	None
CS181 SLO 3	Spr 2012	Final project	Score for technical competency.	Wagner	Spr 2012	None

**DO NOT LEAVE FINAL COLUMN BLANK