

This document presents Continuous Improvement Plan (CIP) for the Computer Science and Information Systems Programs of the Computer Science Department at the University of Puerto Rico at Bayamón. The report describes each of the 8 stages of the CIP, and a schedule to perform it.

Continuous Improvement Plan

August 2013- May 2016 Cycle

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Acronyms

- AAC – Accreditation and Assessment Committee
- CIP – Continuous Improvement Plan
- CS – Computer Science
- IS – Information Systems
- PEO – Program Educational Objectives
- PI – Performance Indicators
- SO – Student Outcomes

Continuous Improvement Plan Revisions

Several revisions have been done since the plan was originally drafted. Updates to the CIP have been the following:

- January 2014:
 - The AAC included stage 8 as the final stage of the previous cycle.
- March 2014:
 - The schedule was modified.
 - Some grammatical errors corrected.
- May 2014:
 - The recurrent event schedule was included.
- August 2014:
 - Section explaining the August-2013 – May 2016 Three year Cycle.
- September 2014:
 - The Schedule was modified.
 - Some grammatical errors were corrected.
 - Stage 3 update, the mission and vision of the institution is been reviewed. Therefore we need to review our department's mission and vision.
- August 2015
 - Some comments were added
 - SICI 4038 manual was introduced to professors giving this course.
- December 2015-January 2016
 - Minor grammatical and syntax errors
 - Since post-test was revised and questions were added we needed to revise this plan.
- October 2016
 - Modified the outcomes and performance indicators not measured in the post test.
- September 2018
 - Minor semantical and syntactical errors.

The Three Year Cycle (August 2013-May 2016)

The AAC modified the CIP for spanning more than two years. Previous, CIP for the 2011-2013 Cycle covered from August 2011 to May 2013 spanned two academic years¹. The AAC decided to use a three year cycle instead after our experience with a two year cycle. The decision for choosing a three year cycle is tied to the curricular revision of August 2013. Freshmen that entered on August 2013 enrolled directly on the new programs. However, there are students from the August 2008 curriculum that changed to the new curriculum. The AAC will only have the required data to perform a final analysis in May 2016 from those students that are now enrolled into the new curriculum.

The AAC will refer to cycles using the *month-year to month-year* nomenclature from now on.

Continuous Improvement Plan

Overview

The Continuous Improvement Plan (CIP) for the August 2013-2016 cycle is presented in this document. Figure 1 presents the CIP. Every phase of our CIP is presented separately in the following sections. We will begin with Stage 8 of the 2011-2012 Continuous Improvement Cycle (CIC). This is the last phase of our previous cycle.

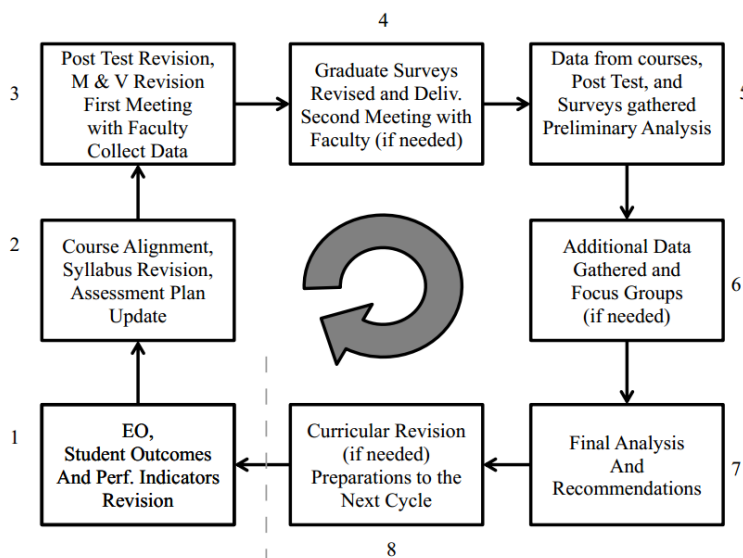


Figure 1 CIP for August 2013- May 2016

Stage 8 – Intermediate Phase – Preparations to the Next Cycle

This is a new task that did not exist on previous CIP. The AAC modified the CIP on January 2014 based on previous experience. A curricular revision resulted from previous cycle. Therefore, we needed time

¹ Academic Years – August 2011-May 2012, August 2012-May 2013.

for readjusting to our new curriculum. We envision that this is a possible outcome of the continuous improvement process for the next cycle. The following tasks resulted from a curricular revision:

- Creation or adoption of new courses
- Faculty approval of the modified curriculum
- Meeting with other departments
- Change on the pre-requisite structure of the courses
- Submitting the changes to higher echelons
- Approval of the changes by all the higher echelons
- Implementation of the changes at the department level
- Update of our promotional materials
- Changes on our SIS (Student Information System)
- Modification of the UPRB Website
- Orientation to our staff about the new curriculum
- Student orientations of our revised curriculum
- Offer to our currently enrolled student the option of changing to our revised curriculum.

We didn't envision all this work in our previous CIP.

Stage 1 – PEOs, Student Outcomes and Performance Indicators Revision.

Revision of the Student Outcomes (SO) could surface as a result of the previous cycle. Consequently, performance indicators (PI) could also change. This also could affect our Program Educational Objectives (PEO)s. The AAC must align them based on the recommendations obtained from the previous cycle. If there is a change on our SOs or PIs, the AAC should prepare a document stating the change.

Documents prepared at this stage

The Performance Indicators Revision Report for CS and IS should be drafted during this stage².

After the PEOs, SOs, PIs have been revised; the alignment with the Institutional Goals (Institutional Outcomes) must be revised. It is very important to check if the institutional outcomes change.

This alignment is presented on Table 1.

² This document was drafted during the second semester of 2013-2014.

PEO	Institutional Goals							
	1a	1b	2	3	4	5	6	7
1			X	X	X	X	X	
2			X	X	X	X	X	
3						X		X
4								X
5	X	X						
6								

Table 1 Institutional Goals and Program Educational Objectives Alignment

Stage 2 – Course Alignment, Syllabi Revision and Update to Our Assessment Plan.

Syllabi must be revised after the PIs changed. After the PIs revision, a modification to the alignment of the SOs with the courses for each program must be performed. A Sample of these tables is presented in Appendix A. During this stage, the AAC requests sample coursework to each professor that have given the course already. This is done to find evidence that the performance indicators that are measured within the course **are covered**. If this evidence is not presented, the AAC evaluates if some of these performance indicators included in the Syllabus must be re-classified³ or eliminated. This impacts directly the alignment presented in Appendix A.

It is possible that some courses need to be revised in order to include instruments that measured some PIs. Therefore, a faculty meeting is held to present the course alignment. This meeting or meetings could be held with all the professors. Also the AAC envisions that these meetings could also be performed individually. The purpose of these meetings is to re-focus some courses.

During this stage the professors make a compromise with the AAC of what they will performed to cover each PIs.

Documents prepared at this stage

- Course alignment table shown in Appendix A.
- Revised Syllabi.

Stage 3 – Post Test Revision, Mission and Vision Revision, First Meeting with Faculty, Collect Data.

The AAC should study and revise the Post Test. The Post Test is extremely important since the Post Test is the **main direct measure** we use for most of the SOs. Post Test was revised during the first semester (2015-2016) and the revision have been administered since December 2015.

³ The AAC envisions classifying the Student Outcomes that are covered but not measured as introductory or supportive. However, the ones that are going to be used for further assessment are the ones measured.

Currently the Post Test is administered using our Moodle web site. However, the AAC must evaluate if it will continue using this tool form administering the Post Test. This is foreseen during this phase⁴.

Also, the AAC could consider the revision of the Mission and Vision. This is important since the new Mission and Vision of the institution is currently been under review (September 2014). This revision should be made with the participation of all the constituents⁵. However, the AAC will consult the faculty of out department first. Further changes need to be suggested and approved by all the constituents if and only if there is a change in the wording of the Vision and Mission. If there is no change on the Mission and Vision there is no need to contact any constituents.

A faculty meeting is held to discuss the updated course alignment, and the assessment tools that will be used to measure the Student Outcomes. Also deadlines are set so the professors could hand in the material needed by the AAC on time.

Documents prepared or revised at this stage

- Post Test Revision document
- Mission and Vision revision document (optional).
- Course alignment tables (if needed).

Stage 4 –Surveys Revision, Second Meeting with Faculty.

The AAC foresees that during this stage a revision of the surveys delivered to our graduates and employers is performed. Also the administration of the surveys begins at this stage. These surveys tend to capture quantitative and qualitative data of our program. The results are used to evaluate and assess our Program Educational Objectives. The data gathered by these surveys have to be analyzed as part of the Final Analysis at stage 7.

It is possible that we need another faculty meeting as a follow up of our continuous improvement process. Sometimes this meeting is needed to keep in touch with the schedule. If the Mission and Vision was modified it is presented to the faculty during this meeting.

Documents revised at this stage

- Employee Survey.
- Graduate Survey.

Stage 5 – Data is gathered from courses, Post Test and Surveys, a Preliminary Analysis is Performed.

The AAC envisions compiling all the assessment tools needed to perform the analysis during this stage. Also a preliminary analysis is performed formally or informally. This could give the AAC an idea if there are extra materials or focus groups needed to analyze data.

⁴ We already loose some data when the Moodle w2bsite was updated to a newer version of Moodle.

⁵ This includes Students, Faculty, Staff and the External Advisory Board.

Documents drafted at this stage

- Continuous Improvement Report is at a very early stage.

Stage 6 – Additional Data Gathered and Focus Groups (optional stage)

This is an optional stage. Since this is a continuous improvement process it may be possible that not all the evidence is available to make a final analysis. During this stage, the AAC needs to revise if all the evidence is there to start the Final Analysis. If evidence is missing the AAC could request to gather additional data on specific courses. Also, the AAC could even create ad hoc focus groups to analyze some PIs.

Documents drafted at this stage

- Focus Group purpose key discussion topics and final recommendations (optional).

Stage 7 – Final Analysis and Recommendations.

During this stage the Final Analysis is performed. The AAC meets regularly to analyze all the data gathered from previous stages. The Continuous Improvement Report⁶ is drafted for the IS and CS program.

The Final Analysis

Results from the Post Test and the Graduate Questionnaire are analyzed. Triangulation is performed if there is a discrepancy between these two assessment tools. The AAC could decide if it will use the assessment tools from the courses if this happen.

The AAC knows that there are some PIs that cannot be measured only via de Post Test or the Graduate Survey. These PIs will be analyzed with other assessment tools (usually rubrics). For example, outcomes:

- (d) An ability to function effectively on teams to accomplish a common goal.
- (f) An ability to communicate effectively with a range of audiences.

These outcomes cannot be measured using the Post Test or the Graduate Survey. Therefore we need to use rubrics to measure them.

The achievement of each and every student outcome is classified based on the level of achievement of each performance indicator. The classifications used are

- Met
- Partially Met
- Not Met

Recommendations

Finally, recommendations are drafted and presented to the faculty. A document named as Implementation of Recommendations and Status Report is drafted for each program of the Computer

⁶ Continuous Improvement Final Report will be its new name.

Science Department. This report must contain the status and the recommendations to improve on each and every criterion that is evaluated by the Accreditation Agency (or Agencies) that review our programs.

Documents drafted at this stage

- A final version is drafted of the Continuous Improvement Report.
- Implementation of Recommendations and Status Report

Schedule for the August 2013-May 2016 Cycle

Non-Recurrent Events Schedule

Table 2 CIP Schedule presents the CIP Schedule planned for August-2013-May 2016 Cycle. Last revision of this schedule was performed on September 2014.

Stage	Begins at:	Ends at:
Preparations to next cycle (8) and Stage 1	August 2013	December 2013
Stage 1 and Stage 2	January 2014	May 2014
Stage 3	August 2014	December 2014
Stage 4	January 2015	May 2015
Stage 5	August 2015	December 2015
Stage 6 and 7	January 2016	May 2016
Stage 8 (preparations to next cycle)	August 2017	December 2017

Table 2 CIP Schedule

Recurrent Events Schedule

There are some events that are recurrent.

- Continuous Education and Career Path Questionnaire
- Administration of the Graduate Questionnaire
- Post Test Administration

These events are presented in Table 3.

Event	Schedule
Continuous Education and Career Path Questionnaire	Every time Capstone Course (SICI 4038) is offered
Graduate Questionnaire (administration)	Each May 2014, 2015, 2016
Post-Test (administration)	Every time Capstone Course (SICI 4038) is offered

Table 3 Schedule for Non Recurrent Events

Appendix A

Sample table for Course and Outcome Alignment for the Computer Science Program

Course	A.1	A.2	A.3	B.1	B.2	B.3	C.1	c.2	C.3	D.1	D.2	E.1	e.2	E.3	f.1	F.2	F.3	g.1	G.2	G.3	H	l.1	l.2	J.1	J.2	J.3	J.4	j.5	k.1	k.2	
COTI 3101 - Algorithms and Progs. Devel. 1	0	I	I	I			I	I														I							I		
COTI 3102 - Algorithms and Progs. Devel. 2	0	I	I	I			I	I														I	I					I	I		
COTI 3205 - Computer Organization	0	I	I	I			I	I																							
COTI 3305 - Computing, Ethics and Society Seminar	6											X	X	X				X	X	X											
COTI 4039 (SICI 3039) - Comparative Prog. Languages	2							X																				X			
COTI 4250 - Intro. Theory of Computation	3		X																				X			X					
COTI 4255 - Introduction to the Analysis of Algorithms	10	X	X	X			X	X	X														X		X	X	X				
COTI 4306 - Undergraduate Seminar	4															X	X	X				X									
SICI 3015 - Analysis and Design of Info. Sys.	14			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X							X		
SICI 4019 - Computer Architecture	3														X	X	X							I							
SICI 4028 - Operation Research for Computer Science+	5		X	X						X													X	X							
SICI 4029 - Fund. Of Operating Systems	10	X	X	X	X		X							X								X	X		X		X	X			
SICI 4030 - Database Program Development	4		X	X	X		X																								
SICI 4036 - Data Structures	9	X	X	X	X		X	X														X			X	I		X			
SICI 4037 - Data Communications	4		X							X	X				X																
SICI 4038 - Research Workshop	7			X	X	X	X	X														X	X						X		
		3	2	7	6	3	2	3	5	3	3	2	2	1	2	5	3	3	1	1	1	2	3	2	3	1	3	2	2	3	2

Sample table for Course and Student Outcome Alignment for the IS Program

Course	A.1	A.2	A.3	A	B.1	B.2	B.3	B	C.1	C.2	C.3	C	D.1	D.2	D	E.1	E.2	E.3	E	f.1	F.2	F.3	F	g.1	G.2	G.3	G	H	H	l.1	l.2	I	J.1	J.2	J.3	J.4	j.5	J	
COTI 3101 - Algorithms and Progs. Devel. 1	0	0	I	I	I				I	I																					I								
COTI 3102 - Algorithms and Progs. Devel. 2	0	0	I	I	I				I	I																					I	I							
COTI 3205 - Computer Organization	0	0	I	I	I				I	I																													
COTI 3305 - Computing, Ethics and Society Seminar	6	2														X	X	X	@					X	X	X	@												
COTI 4150 - Information Systems Programming	7	2	X	X	X	X	X	@		*																			X	X	@								
COTI 4210 - Web Applications Programming	4	1																						X	X				X	X	@								
SICI 3211 - Info. Systems Foundations	3	0											*	*		I	I	I															X	X	X				
COTI 4430 - Systems Project Management	6	3			*	*	*		X	X	X	@	X	X	@														X	@	*	*							
SICI 3015 - Analysis and Design of Info. Sys.	11	2			X	*	X	@	*	X		X	X	@	X	X				*	*	*							*	*		X	X	X	X				
SICI 4019 - Computer Architecture	3	1																		X	X	X	@																
SICI 4028 - Operation Research for Computer Science	0	0		*	*								*																										
SICI 4029 - Fund. Of Operating Systems	3	1	*	*	*				X											*									X	X	@								
SICI 4030 - Database Program Development	2	0		*	*	X			X																														
SICI 4036 - Data Structures	3	1	X	X	*	@	*		*	X																						*							
SICI 4037 - Data Communications	2	1		*									X	X	@					*																			
SICI 4038 - Research Workshop	8	2			X	X	X	@	*																			X	@	*		X	*	X	X	X			
		2	1	1	3	3	3		3	1	3		3	3		2	1	2		1	1	1		2	2	1		2	@	*	3	3	3	2	3	2	3	2	1