

University of Puerto Rico at Bayamón

Implementation of Recommendations  
For the Computer Science and  
Information Systems Programs

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**For Cycle 2019-2022\***

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## Overview

This report is prepared at the end of each cycle by the Accreditation and Assessment Coordinator (AAC) to provide an insight of how to implement changes to our Computer Science and Information Systems programs. The AAC analyzes, reflects, and summarizes recommendations obtained directly from the instruments used for assessment, and also from other sources, for the further improvements of each criterion. This document, also, aims to capture the status of each and every criterion at the closure of the cycle and to contrast them to a previous cycle.

## Criterion 1: Students

All of the following recommendations will impact students ultimately.

## Criterion 2: Program Educational Objectives

During this cycle there were no changes to the PEOs. The PEOs are the same for both programs. The PEOs are broader statements that apply to a professional that has graduated from each of the programs.

## Criterion 3: Student Outcomes

### Performance Indicators and Student Outcomes

There were changes during September 2024, after knowing that mappings between the student outcomes that we had and those of the accrediting agency were not allowed. This unexpected event caused us to adopt the ABET student outcomes explicitly. It was not difficult to refocus the performance indicators to the ABET student outcomes. However, I recommend that the PIs be reviewed/revise in the next cycle.

The accreditation agency has required the exposure to parallel and distributed computing for the CS program. We know we have included this exposure into several courses, however, there is no PI that could measure it. The AAC recommends adding a new PI and questions on the post-test, however, we need to discuss this with the faculty or with the curriculum committee.

## Syllabi

### Syllabi in English

All Syllabi should be in English. We are encouraging that all professors have updated English versions of their syllabus. This task has been an ongoing one. We **have not achieved the goal** of having each and every one in English. We are improving in that matter, however, there is much to be done. We must keep a department compromise to achieve this goal. The AAC envisions that this task should be accomplished by the end of the next assessment cycle.

## Criterion 4: Continuous Improvement

### Continuous Improvement Process

The continuous improvement process is not a rigid one and therefore, it is subjected to change. However, we need to improve our way of implementing it. Our plan was **off schedule** and *did not end at the time we envisioned it*. The lockdown that resulted from the COVID-19 global pandemic also affected our envisioned timeline. We need to stick into the deadlines we have auto imposed on ourselves. We need to improve in that direction.

### Post Test Revision

Some of the questions related to the PIs should be revised. However, if the AAC determines that some of these questions do not require a change, then, the AAC should reconsider strengthening the PI in the courses that cover them. This event should be presented in the document called Post-Test Revision Report on the next cycle.

The revision for the CS program is composed of:

- Questions related to PI (a.3) - (revised the questions again)
- Questions related to PI (b.1)
- Questions related to PI (c.1)
- Review the drafting of questions related to (c.2)

The revision for the IS program is composed of:

- Questions related to PI (a.3) - (revised the questions again)
- Review the drafting of questions related to PIs (c.1), (c.2)
- Review the drafting of questions related to PIs (j.1), (j.2)
- Review the drafting of questions related to PI (a.2)(j.3)

## Criterion 5: Curriculum

The curriculum committee should meet to reflect on our findings. Sometimes, faculty chat in the hallways about ideas to reinforce the curricula of both programs. This is based on our findings, trends and observations.

### Computer Science Program

One of the issues we need to think about is whether we really need to add a course in parallel processing to the Computer Science program. Our students currently have some exposure to the topics related to parallel processing, however, is it sufficient? The curriculum committee should have a meeting and discuss this issue.

### Information System Program

Professors on the Information System program have talked informally about adding an information security course that is more focused on the Information Systems program. Those conversations have to materialize into actions over the following months. The curriculum committee should have a meeting and discuss this issue.

The findings obtained after analyzing PI (a.2) show that the level of attainment was unsatisfactory. The AAC recommends straightening outcome a. This matter should be addressed on the next assessment cycle. The AAC recommends that a meeting with the IS professors should be held about this finding. Also, a plan should be discussed on how to strengthen this outcome.

### Criterion 6: Faculty

There are some challenges that we need to address in terms of faculty.

#### Aging Faculty and Attrition

Two full time faculty members from the Computer Science emphasis area retired during Academic Year 2022 and 2023. The impact of losing these two faculty members has not been substantial based on system wide attrition. The department has coped with the problem by hiring two full-time instructors under contract and a few adjunct professors.

Currently, there are three professors, (two from IS and one from CS) that are capable of soliciting retirement in the following years. Although their *intentions are not immediate*, we are anticipating that possibility today. Moreover, the last two tenure-track positions were granted in 2009. These professors who joined in 2009 are already in the middle of their careers and they already have their tenure. Moreover, they are currently full-professors. The department has hired instructors under contract that could “refresh” the faculty, however, they are hired semester by semester.

The AAC recommends that the Department’s Personnel Committee along with the Department’s Chair should study the possibility of soliciting to the central administration, via the Dean of Academic Affairs, at least two full time tenured track positions for our department. These positions should be of professors with Computer Science and Engineering expertise that are capable of teaching Computer Architecture, Operating Systems, Numerical Analysis and Operations Research. The professors that retired already were the experts in these courses.

#### Professional Development of the Faculty

Each employee is required to complete 20 hours of continuing education in official material from the Government Ethics Office of the Government of Puerto Rico every two years. The accountability of this task rests in a central government entity and at the Chancellor. Employees that do not comply with this received a memo/letter from the Chancellor that is added to their record in human resources.

Certification 36-2010-2011 of the Academic Senate dictates that each faculty must complete a minimum of 6 hours of professional development activities, per fiscal year, related to the area of work (expertise). Those professors that are candidates for a promotion must complete a minimum of 14 hours per fiscal year. There exists accountability for those professors that are soliciting promotion via the Faculty Personnel Committee (institutional committee) and the department's chair. Professors that do not fulfill the minimum requirements are not eligible for promotion. However, there is no accountability for those that have already been promoted to full professors or for those that never solicit a promotion.

Most of the CS and IS faculty have participated in several workshops, lectures and panels during the assessment cycle. It is evident to us that there are professors that have updated their courses via changing compilers, adding new knowledge to their courses, and imparting courses of interest to the students that use cutting-edge technology<sup>1</sup>. However, it is not easy to account for those changes, since there is no formal training when professors are developing their professions in these matters. These elements are performed in a self-taught matter.

The AAC tries to compile the information it receives regarding the professional development activities of the faculty to comply with the Faculty Professional Development Plan (FPDP). However, the AAC does not have the means to enforce the accountability of the faculty members into engaging in professional development. The only thing it could do is to recommend, advise, and encourage the fellow faculty members into engaging in professional development. Accountability is needed not only at the department level but also at the institutional level. This is a very sensitive and difficult task that goes beyond the scope of the duties of the AAC.

## Criterion 7: Facilities

The serious situation that our buildings suffered after the impact of Hurricane María has been managed. FEMA approved a rebuilding plan of 5 buildings at our university. Currently the UPRB is undergoing a transformation in terms of infrastructure. Five buildings have already been demolished. A plan to build a new 4-story building that also will house faculty offices has already been approved.

Our faculty have been abandoning their offices in the buildings impacted by Hurricane Maria. There are already several professors who have been officially moved from the Academics Building I to building 100. There are other professors who are servicing students in offices in the Science and Technology Complex building (CCT). There are also others who officially coordinate their visits in their administrative offices. This situation has been managed organically while the new building that will harbor the new offices is being constructed.

It is envisioned that during Academic Year 2024-2025, the Department's Office will be moved to building 100. Currently, the Department's Office is on Academics Building I and has some water leaking under the floor.

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<sup>1</sup> For example: Topics include: Mobile app development using Kotlin, Arduino for IOT, Big Data (Data Science), Adding new coding trends.

## Issues beyond the Continuous Improvement Process

We have no doubt that the graduating class fully complies with the student outcomes. There is a concern from the AAC regarding the future of our retention and graduation numbers. The University of Puerto Rico has continued to lower the IGS in order to remedy the problem of the population decline that the island has faced after the impact of Hurricane Maria in 2017. Figure 1 presents the minimum admission index (minimum IGS) that was admitted to our department since 2003. Notice that there has been a decline since 2017. This can have an impact on the retention of our students and the numbers we are graduating.



Figure 1: Minimum IGS that was admitted from 2003 to 2023

Currently the assessment process is mostly used to look back in time. It analyzes whether those who have graduated achieve the student outcomes satisfactorily. However, we have no way of making forecasts related to the issues of retention and graduation today. We have to see how we are going to deal with students with less skills to pursue a career in our four year programs.

We should reflect about reviving and reconstructing the associate degree in order to safeguard the baccalaureate degree. An idea that could safeguard us from this event is to develop stackable programs. Students admitted with low IGS can be admitted directly into a stackable program, whether it is a certificate or an associate degree. If they demonstrate the necessary skills, they can opt to be transferred to our four year programs. Students who meet the established entry rates would go directly to the baccalaureate programs.