Florida A&M University

Department of Computer Science

Academic Program Review External Evaluation

Computer Science, Information Systems, and Information Technology

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III. Introduction
This report is submitted in response to a request for external evaluation of the three programs in the Florida A&M Computer and Information Sciences Department as is required in Florida regulations.

IV. Status of Discipline (national perspective)
There is little to add to the Status of Discipline description given in the self-study. Computing continues to be a growth field in industry, government, and academia. The potential for new jobs dwarfs that of all engineering fields combined. As a relatively young discipline, computing is a target-rich environment for both basic and applied research. Because computing builds on fundamental scientific concepts such as mathematics, it is well-positioned in programs at institutions of higher education.

V. Program

1. Overall comments regarding existing program
The FAMU Computer and Information Sciences Department is a mature department with mature faculty and a history of academic success. They offer four complementary computing degrees with undergraduate degrees in Computer Science, Information Systems, and Information Technology and a Master’s Degree in Computer and Information Science. The undergraduate curriculum provides sufficient breadth to appeal to a broad constituency of students with interest in computing. The graduate program provides students upward mobility in their academic endeavors and offers the faculty support and encouragement in expanding their scholarly endeavors and professional development.

2. Appropriateness of program goals and objectives
The goals listed in paragraph II.3 of the Self Study appear to be extracted from the University’s goal statement, thus they are not department specific. The lack of specificity likely contributes to the noticed lack of measurability, i.e. how can the satisfaction of goal 1.2 be determined? Is one evaluation every seven years sufficient? If so, that need not be a goal, since it is mandated in state regulations.

Similarly for goal 1.3; what is the measure for determining if academic performance has been improved and what is the baseline for improvement?

This type of goal setting is common in academia. An alternative is to establish benchmarks based on measurable criteria such as enrollment, retention, # of students going on to graduate school, faculty contact hours, etc. that may be tracked in accordance with goals at the University and College level. A further improvement would be to analyze and select several “aspiring” universities and provide baseline metrics and targets devised from them.

The absence of departmental objectives in the self-study that could address the specificity issue is likely reflective of the leadership challenges the department has experienced recently.
Mentoring and planning support are required to create a clear vision of where the department expects to go.

Finally, there is a notable absence of a goal relating to establishing and maintaining excellent industry partners. This is vital both for student employment and to help deliver balance between theory and practice in the academic programs.

3. **Appropriateness of admissions and graduation requirements**

The absence of department specific admission requirements complicates the delivery of academic content in the department. The department has addressed the need to accommodate students with differing interests and capabilities by offering three undergraduate degree programs. Establishing departmental admission standards would likely improve consistency of content delivery.

Admissions requirements for the Master of Science program are appropriate.

4. **Appropriate number of credit hours for degrees**

The IT and IS degrees meet the standard 120 hour threshold, with a rigorous set of computing courses in the major. The number of hours is appropriate.

Regarding the Master of Science degree, in my experience, 30 contact hours is the lower end of the spectrum. Increasing the degree to 36 hours could allow an expansion to 6 thesis hours, which will expand student and faculty discovery.

5. **Appropriateness of curriculum, student learning outcomes**

The objectives for the IT program are appropriate with the very minor exception of an extra word in objective C (“having”).

The first objective for CIS (Objective A) (obtain and apply the theoretical knowledge to advanced topics) appears to be stronger than requirement (B) in the CS Core in the MS program where only “knowledge of fundamental topics” is required. This seems to be inverted. Additionally, the “business” focus of the CIS program is absent from the objective statement.

In general, there appears to be a shortage of hands-on, systems-related projects across the department, particularly in the three undergraduate programs. This may reflect the interests of a maturing faculty in a fast-moving field.

For the Master of Science program, the two concentrations appear to have the same learning objectives, with two exceptions:

a. There is a thesis requirement in the CS core verses a project for software engineering (SWE) (which is fine).

b. CS adds a learning objective (D) (which seems well suited to SWE as well).

As they are now stated, the learning objectives lack distinction and clarity. For example, since the SWE concentration is intended to be a professional degree, it would seem that objective A would seek to achieve “advanced knowledge” in SWE with “basic” knowledge in CS. Objective C does not appear to be appropriate, since this is a professional degree without a thesis.
requirement. Similarly, objective D may be not be appropriate, particularly the requirement for CS research. On the other hand, it would seem that this degree would expect graduates to come out of the program with a detailed understanding of the software development process and the tools of the trade that would them to be immediately productive in the software marketplace.

For the CS core, it isn’t clear to me why objective A is included.

6. **Adequacy of program’s self-evaluation mechanisms: comment on**
The department displays extensive assessment planning, including accreditation, self-assessment, and university assessment. The processes are clearly in place to accomplish effective assessment. It isn’t as clear how the assessment results are fed back into the planning process.

7. **Academic Learning Compacts and Assessment Plans, including the methods of assessment; comment on the extent to which students appear to be meeting the learning outcomes based on samples of student work and results of assessment**
The department faces challenges in attaining the designed outcomes in the CIS program, as is reflected in the self-study. This may be a reflection of the inconsistencies in the goals and objectives noted above. IT and MS program outcomes are well within the prescribed thresholds in most cases.

8. **Suggestions for improvement of existing programs**
Please see the notes relative to learning objectives in paragraph 5 above.

There are two minor issues with undergraduate degrees. There needs to be name consistency for the CIS. It is listed on the web page as “Information Systems” but in other materials is shown as “Computer Information Systems”. This may create confusion for both undergraduate and graduate students that are seeking a MS in CIS.

Also see the recommendations related to the MS program in paragraph 9.

9. **Comment on whether there are too many required courses, or degree tracks, or too few?**
The number of students in the undergraduate programs appears to be appropriate. However, the distinctions between the CS, CIS, and IT programs may not be well addressed in the department’s literature.

As an administrative note, the IT program is not included with the other College of Science and Technology programs on the University’s Undergraduate Programs website (http://www.famu.edu/index.cfm?academics&UndergraduatePrograms).

The MS program is at near crisis stage, with diminishing enrollment and small classes. It is not clear that the program’s constituency can support even one MS program. At a minimum, the department should consider consolidating the two programs to reduce the department’s teaching requirement.

If graduate education in the department is important to the University, resources are dramatically needed for recruiting, graduate assistantships that cover both tuition and stipend, and facilities that will attract and serve a strong graduate student body.
Finally, a CIS faculty member mentioned that there is a competing program at the undergraduate level, e.g. a program in Management Information Systems. While I am unable to find such a program on the University web site, if such a program exists, it should be carefully evaluated for duplication and impact on internal recruiting competition.

10. Involvement of business and industry in establishing goals, objectives, learning outcomes and curriculum (this item is required for science and technology programs, recommended for others)

The department certainly has connections to industry. However, those connections appear to be stale. There is little evidence of regular interaction with industry partners for planning purposes.

11. Articulation with Community colleges (AA and AS) for bachelor’s programs

The articulation information contained in the self-study is consistent with good practice.

VI. Students

1. Adequacy of enrollment, retention and graduation

Enrollment numbers over the past three years are consistent, being in the low to mid two hundreds. This enrollment level is appropriate for the faculty and facility size and appears to be financially viable. Industry demand should be expected to grow and the pool of students seeking computing careers will likely grow for the foreseeable future, so the department’s growth potential depends on the University’s ability to provide modern or modernized facilities and new faculty lines.

2. Adequacy of advising and other academic support services

Advising and student services are well-developed and appear to be functioning appropriately.

3. Outcomes, placement, and satisfaction of students and graduates

The survey reflects good student placement results and student satisfaction. This was also reflected in student interviews during site visit.

VII. Faculty

1. Quality and productivity in teaching

Faculty members are teaching a high course load and students are being effectively placed. Teaching quality and productivity are high.

2. Faculty productivity in basic and applied research

Faculty members have little time or resources to conduct meaningful research due to heavy teaching loads, and limited assistance in grant proposal preparation and administration.

3. Quality of departmental leadership

Though not documented in the self-study, there appears to have been significant turnover that has presented a significant challenge to the department. The College appointed a senior faculty member as interim chair who is imminently qualified and competent. Additionally, the reassignment was not accompanied by a replacement for the faculty position that the interim chair vacated to move to the Chair line. With only one secretary to assist, the interim chair is
overwhelmed by the magnitude of the Chair responsibilities, which often must submit to regular teaching, advising, mentoring, etc.

4. **Appropriate workloads**
The standard teaching assignment is 4 and 4 and this appears to be the load for most faculty members. Maybe the main exception is that some faculty members regularly undertake an overload in order to receive an additional stipend. While instruction does not seem to suffer, it clearly has had a negative impact on discovery and faculty development in the department.

5. **Adequacy of faculty to deliver program (number and qualifications of faculty)**
Nine faculty members are delivering coursework in support of four degree programs, including a Master’s program that has two majors.

6. **Use and integration of adjunct faculty**
There appears to be minimal use of adjunct faculty.

7. **On-going professional development**
There appears to be little attention to professional development in the department. The policy of incentivizing faculty members to undertake teaching overloads seems to confirm this observation.

VIII. **Resources**
1. **Effective use of resources**
The CIS program appears to be effectively using the resources that are available to them. Their offices are properly allocated and classroom and laboratory spaces are in full use.

2. **Adequacy of access to library resources**
The Internet has diminished the need for high quality, brick and mortar library facilities.

3. **Adequacy of equipment for existing and proposed programs**
While the department has extensive computing resources, many of those resources are aging. There is a need for updating laboratory equipment.

4. ** Appropriateness of space for existing and proposed programs**
The current building is well designed for the department. Unfortunately, the building is aging and in disrepair. The department is unlikely to grow unless the building receives extensive renovation, inside and out. For the department to reach its full potential, a new building is necessary.

5. **Exploration of alternative funding sources (contracts and grants, etc.)**
The environment is not conducive for faculty members to pursue grants. According to the faculty, there is little support for grant opportunity identification or proposal preparation and submission. Moreover, present procurement and grant administration procedures present barriers to effective management of federal funding projects resulting in the perception that winning grants is not worth the effort.
In addition, the policy of paying stipends to faculty members for teaching overloads creates a financial dis-incentive for seeking funded course reassignment for research because it precludes them receiving overload pay.

Under these circumstances, there is little likelihood that faculty members will seek out grant or contract opportunities.

Conversely, philanthropic opportunities abound. Apple, Microsoft, Cisco, and many other large technology companies regularly make donations to assist programs that support underrepresented groups in STEM and high-tech fields.

IX. Responses to Previous Program Review Recommendations
There are mixed results with the previous recommendations. While there have been efforts to energize the External Advisory Board and to work more closely with the business school, those efforts seem to have succumbed to more immediate operational requirements. Internships also seem to be lagging. Of course a new building has not been built, nor is there an imminent plan to build a new facility for CIS.

Conversely, the department’s equipment has undergone significant renovation over the past seven years, though in this fast-moving field, it is time to renovate again. Similarly, two programs were created at the Masters level as previously recommended, though reconsolidation of those programs is now being recommended.

X. Strengths
The department is fortunate to have a mature, stable faculty that knows how to teach, mentor students, and perform discovery research. Dr. Chi and Dr. Allen have been successful in attaining recent federal funding. Dr. Evans and Dr. Jones have also been successful in attaining federal funding in the past and are ready to renew those skills if properly equipped.

The department also enjoys the enduring reputation of FAMU and support of its alumni.

XI. Needs and Recommendations
The FAMU CIS program appears to be in decline. Without immediate attention from the University level, that decline is likely to continue. Computing is the future. If growth in the department is desired, it will take resources. Presently, the department faculty members believe that it requires extraordinary efforts to achieve modest results. That is also my perspective.

1. Recommendations that require no new resources;
   a. While the long term facility problem is widely recognized, one easy, immediate, and required step to reversing the momentum is to keep the existing building and surrounding grounds clean and well maintained. Many CIS students, faculty and staff enter the building through the parking lot, which is in dire need of patches and painting. It is difficult to be proud of a facility that is in disrepair, which also leads to littering and accumulation of garbage in the parking lot. A systematic, persistent program of monitoring, cleaning, and repairing the CIS building and grounds should be engaged.
b. In order to relieve pressure on department leadership, the interim chair (or newly appointed chair) should receive full course reassignment (teaching load of zero) for at least one year in order to focus attention on administration and research.
c. Another low-no cost action would be to direct University recruiting efforts towards attracting students that have expressed an interest in computing or that are otherwise good prospects to select a CIS program as their prospective career field. The recently converted four year “community” colleges may be excellent targets of opportunity for recruiting to the professional MS program.
d. It is recommended that the University revise policies on sponsored program support to incentivize grant activity and the department should leverage those changes by seeking out external collaborations that offer opportunities for joint grant opportunities. To clarify, this is not two separate recommendations; the latter is unlikely to be successful without the former.
e. The department should update the learning objectives of their CIS and MS programs as is described in paragraph 5 above.
f. The College should engage an aggressive leadership development and mentoring for the department.
g. Finally, the department should consider consolidating their MS programs. This would require a decision about the vision for the department’s future, essentially whether it should have a professional or scholarly focus.

2. **Recommendations that require modest new resources; and**

In order to reverse the decline, the department needs two new faculty members and the sooner the better. This is necessary to bring fresh perspectives, ideas, and energy into the department and to eliminate teaching overloads and return research incentives to the faculty.

a. **With the recent departure of a key instructor, the department’s greatest immediate need is for at least two new-hire faculty members. It is recommended that one of those be an instructor along with one new tenure-track faculty member.**
b. The University should fund and staff a new line number for a department co-chair that could manage the EAB, inter-university collaborations, undergraduate research program, etc.
c. There is an imminent need for funding to increase payout for the existing teaching assistant positions to cover both tuition and stipend.
d. In order to incentivize faculties’ scholarly efforts and increase discovery, the University should consider removing the faculty overload incentive, which would need to be accompanied by a merit raise process to avoid a resulting morale problem.
e. It is recommended that the University add at least three teaching assistants to the department.
f. The University should undertake a laboratory renovation project to modernize CIS laboratories.
3. **Recommendations for transformative change that require new resources.**

If Computing is a growth area for the University, a new building is in order. Transformative change is unlikely without a supporting facility.