

# SCHOOL OF COMPUTING & INFORMATION SCIENCES

## **Annual Assessment Summary 2007-2008 for Bachelor of Science in Computer Science**

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### I. INTRODUCTION

This report is prepared in accordance with the Assessment Plan adopted by the School of Computing & Information Sciences (then the School of Computer Science) in spring 2003. Its purpose is to summarize the results of the various assessment mechanisms utilized by the School, and to present the resultant findings and recommendations to the director and faculty of the School.

The objectives of the annual assessment process are to assess the extent to which the outcomes and objectives of the BS in Computer Science program have been met in the period under review, to identify specific areas of the program where a need for improvement is indicated, and to present a set of recommendations for attaining those improvements.

The period under review includes the spring, summer and fall semesters of 2007.

The Assessment Plan is included as Appendix A of this report. The BS Program Objectives and Outcomes document is included as Appendix B.

## II. OVERVIEW

The BS in Computer Science program objectives are the overriding goals of the BS program relating to the content, quality and environment of the students' educational experiences in the program. The objectives are broad in nature and define expected general characteristics of the program.

The BS in Computer Science program outcomes are more specific in nature. Each defines a single expected characteristic of a graduate of the BS in Computer Science program and should be observable at the time a student graduates from the program. Each program outcome supports the attainment of one or more of the program objectives.

Additionally, the required and elective courses in the BS in Computer Science curriculum each have a set of course outcomes. The course outcomes identify specific areas of learning and a degree of attainment (mastery, familiarity, awareness) expected of a student completing the course. The course outcomes support attainment of one or more of the program curricular outcomes.

The means of assessment employed by the School of Computing & Information Sciences are specified in the document, Assessment Mechanisms and Procedures, included as Appendix C of this report. These means include student, instructor and alumni surveys, and recommendations from the School's constituent groups.

The Survey instruments are summarized in the following table:

| <b><u>Instrument</u></b>  | <b><u>Target</u></b> | <b><u>Frequency</u></b> |
|---------------------------|----------------------|-------------------------|
| Alumni Survey             | Program Objectives   | Continual               |
| Graduating Student Survey | Program Outcomes     | Semester                |
| Student Course Survey     | Course Outcomes      | Semester                |
| Instructor Course Survey  | Course Outcomes      | Semester                |

Recommendations are received annually from the following groups:

- Industrial Advisory Board
- ACM Student Chapter
- Women in Computer Science

For administrative purposes, the required and elective courses in the BS in CS major are grouped into five subject areas, Communications & Ethics, Computer Systems, Foundations, Programming, and Software Engineering. Each subject area is managed by a (faculty) Subject Area Coordinator whose duties include evaluation and maintenance of the courses in their subject area, and preparation of an annual report summarizing the responses to both the Instructor and Student Course Outcomes surveys for the period under review. Their observations and recommendations are presented under the relevant headings of the Survey Results section of this report.

### III. SURVEY RESULTS

#### A. Course Outcomes Survey by Students

This survey is completed by students in each section of a required or elective CS class. For each course outcome, the student is asked to state the extent to which he agrees or disagrees with each of two assertions:

- 1: *I believe that this is a valuable outcome for this course, and*  
 2: *The subject matter of this outcome was covered adequately in class*

To each assertion, the student responds on a 5-point scale as follows:

- 5: *I agree strongly,*                      4: *I agree moderately,*  
 3: *I am not sure whether I agree or disagree,*  
 2: *I disagree moderately,*                      1: *I disagree strongly*

For each outcome, a weighted mean of the responses to each question is calculated. The results are provided for each course for each semester, and cumulatively over all semesters of the calendar year, spring, summer and fall. The following table summarizes the cumulative responses to the Student Course Outcomes Survey for the year 2007.

| <u>Course Number</u> | <u>Mean Value of Outcomes</u> | <u>Mean Adequacy of Coverage</u> |          |
|----------------------|-------------------------------|----------------------------------|----------|
| CAP 4770             |                               |                                  | (Note a) |
| CDA 4101             | 4.56                          | 4.52                             |          |
| CEN 4010             | 4.73                          | 4.60                             |          |
| CEN 4015             | 4.20                          | 3.80                             |          |
| CEN 4021             | 4.20                          | 3.35                             |          |
| CGS 1920             |                               |                                  | (Note b) |
| CGS 3092             | 4.59                          | 4.52                             |          |
| CNT 4513             | 4.37                          | 4.05                             | (Note c) |
| COP 2210             | 4.37                          | 4.20                             |          |
| COP 3337             | 4.55                          | 4.33                             |          |
| COP 3402             | 4.41                          | 4.54                             |          |
| COP 3530             | 4.52                          | 3.98                             |          |
| COP 4225             | 4.69                          | 4.38                             |          |
| COP 4226             | 4.75                          | 4.74                             |          |
| COP 4338             | 4.65                          | 4.48                             |          |
| COP 4540             | 4.41                          | 4.00                             |          |
| COP 4555             | 4.40                          | 4.44                             |          |
| COP 4610             | 4.56                          | 3.87                             |          |
| COT 3420             | 4.09                          | 3.75                             |          |
| ALL                  | 4.47                          | 4.21                             | (Note d) |

**Table 1: 2007 Value of Outcomes & Adequacy of Coverage**

Notes for Table 1

(Note a) CAP 4770 Introduction to Data Mining. One section was offered as a CS List-1 elective in 2007. The course evaluation summary does not include data for responses to the overall evaluation section of the student survey.

(Note b) CGS 1920 Introduction to Computing. One section of this new required course was offered in Fall 2007. No student evaluation data are available.

(Note c) CNT 4513 Data Communications was previously offered as CEN 4500.

(Note d) These averages are un-weighted.

(Note e) The following List 1 elective courses were not offered in 2007:

- CAP 4710 Principles of Computer Graphics
- CEN 4023 Component-Based Software Development
- CIS 4363 Computing and Network security

On the 5-point scale, a mean response value of 3.75 from a possible maximum of 5 represents a 75% satisfaction level. This is the current threshold value at which a measured item is deemed to meet its criteria.

From the above table, the outcomes for all courses are perceived by students to have high value, in excess of 80% in all courses. With one exception, students also perceive that the course outcomes are adequately covered in their classes, and at a higher than 80% level in the large majority of classes.

Only one course, CEN 4021, falls below the 75% threshold in student perception of adequacy of coverage. Included here is a recommendation for this course by the Subject Area Coordinator: *There is a need to resolve the issue of cross listing of CEN 4021 with CEN 5064 a graduate course. Some undergraduate students are finding it difficult.*

It should be noted that the student survey data for COP4338 show marked improvement in 2007 (4.65 & 4.48) by comparison with the year 2006 data (4.19 & 3.75).

The following table compares the annual course ratings, averaged over all classes, for the years 2004, 2005, 2006, and 2007 the year under review.

| <u>Year</u> | <u>Mean Value of Outcomes</u> | <u>Mean Adequacy of Coverage</u> |
|-------------|-------------------------------|----------------------------------|
| 2007        | 4.47                          | 4.21                             |
| 2006        | 4.45                          | 4.22                             |
| 2005        | 4.45                          | 4.22                             |
| 2004        | 4.44                          | 4.28                             |

**Table 2: Comparison of Annual Outcomes Ratings, 2004 – 2007**

We conclude that generally, the course outcomes continue to be perceived as highly valuable by our students, and are thought to be covered in classes at a high level, well above the threshold 75%.

## **B. Course Outcomes Survey by Instructors**

This survey is completed by each instructor of a required or elective CS course section. The Instructor separately rates the individual course outcomes in respect of two criteria, student preparedness and adequacy of coverage. The rating is on a 5-point scale. In addition, the Instructor may append general comments and suggestions specific to each course outcome. These responses, comments and suggestions from the surveys for the period under review are incorporated into the Subject Area Coordinators' reports, The complete reports are included as appendices I, J, K, L and M. Extracts from these reports that address the Instructor Course Outcomes Surveys are presented in this section. It is sometimes impractical to filter observations specific to the Instructor surveys. In these instances, the extract may contain references to the Student Outcomes Survey responses.

### Subject Area: Communications & Ethics (Reported by Pat McDermott-Wells)

CGS 3092 Professional Ethics and Social Issues in Computer Science

COM 3011 Business and Professional Communication

ENC 3211 Report and Technical Writing

COM 3011 and ENC 3211 are taught by other instructional units and consequently are not subject to the School's assessment mechanisms. The Subject Area Coordinator's report addresses CGS 3092 only.

CGS 3092

*All objectives were covered on an assignment or in an in class discussion*

*All objective were considered essential*

*Most objectives were covered extensively except for team problem solving*

*Most prerequisite objectives were considered incidental*

*Recommendation: We should consider changing the prerequisite for this course to one semester of programming (COP 2210 or COP2250)*

### Subject Area: Computer Systems (Reported by Masoud Sadjadi)

CDA 4101 Structured Computer Organization

CNT 4513 (previously CEN 4500) Data Communications

COP 3402 Fundamentals of Computer Systems

COP 4225 Advanced UNIX Programming

COP 4540 Database Management

COP 4610 Operating Systems Principles

COP 4226 Advanced Windows Programming

COP 4991 Windows Component Technology

CIS 4363 Computing and Network Security

COP 4610 Operating Systems Principles

COP 4xxx Windows Component Technology

CDA 4101 Structured Computer Organization

*Four out of the five outcomes were indicated as essential by the instructor and they were all covered adequately in the two tests and one term project. However, the last outcome, indicated as inappropriate in spring 2007 and appropriate in fall 2007 by the same instructor, but it was either not covered at all or the coverage was not enough*  
*Recommendation:* *I recommend no changes to the outcome of this course. Referring back to the reports of the past two years for this course, you can see that there are two minor issues with this course: first, students are not adequately exposed to the shared memory and MPI concepts at the end of the class as suggested; and second, there is no homework assignment, except for the term project. Unfortunately, the same exact problems have persisted for the last year sessions of this course. This means that either the recommendations have not been properly communicated to the instructor of this course or the instructor has neglected or failed to address the problems in his classes adequately. The good news is that the two issues mentioned are both minor issues that can be easily addressed in the future classes of this course.*

#### CNT 4513 Data Communications

*The course has eight outcomes that have been all indicated as either essential or appropriate by the two instructors and have all been covered either extensively or adequately by them through the assignments, tests, and term project.*

*Recommendation:* *I recommend no changes to the outcome of this course. I recommend the following textbook to be used for this course: Computer Networking, A Top-Down Approach, 4th Edition, by James Kurose and Keith Ross, Addison Wesley (ISBN: 0321497708).*

#### COP 3402 Fundamentals of Computer Systems

*This course has five outcomes that have been indicated as either appropriate or essential by the instructor and according to him the outcomes have been adequately covered in the class. The students' evaluations in the two sessions of spring 2007, however, indicate inadequacy of the coverage of some of the outcomes.*

*Recommendation:* *I recommend no changes to the outcome of this course.*

#### COP 4225 Advanced UNIX Programming

*This course has six outcomes, all indicated by the two instructors as either appropriate or essential. However, the last two outcomes, namely, "C-Shell, AWK, and Perl Programming" and "Interprocess Communication", have not been covered by one of the instructors sufficiently.*

*Recommendation:* *I recommend no changes to the outcome of this course. To better cover the last two outcomes, I suggest extending the term project to include some shell and network programming.*

#### COP 4540 Database Management

*This course has seven outcomes, all of which has been indicated by the instructors as either essential or appropriate. One of the outcomes, namely, "Be familiar with writing application programs that use SQL", by one of the instructors was not covered adequately according to the student evaluations.*

*Recommendation:* *I recommend no changes to the outcome of this course.*

#### COP 4610 Operating Systems Principles

*This course has five outcomes, four of which have been indicated as appropriate or essential by the two instructors. However, the fourth outcome, namely, “Disc Allocation and Arm Scheduling”, seems as a good topic for an Advanced Storage Systems course, not for an undergraduate Operating System Principles course.*

*Recommendation: I recommend removing the fourth outcome of this course, namely, “Disc Allocation and Arm Scheduling”. Also, the other outcomes should be revisited to include the following topics: Processes and Threads, Deadlocks, Memory Management, Input/Output, and File Systems.*

#### COP 4226 Advanced Windows Programming

*This course has seven outcomes, all of which have been indicated as appropriate or essential by the instructor.*

*Recommendation: I recommend no changes to the outcome of this course.*

#### Subject Area: Foundations (Reported by Geoff Smith)

MAD 2104 Discrete Mathematics

COT 3420 Logic for Computer Science

COP 4555 Principles of Programming Languages

MAD 3305 Graph Theory

MAD 3401 Numerical Analysis

MAD 4203 Introduction to Combinatorics

MHF 4302 Mathematical Logic

Of these, all but COT 3420 and COP 4555 are taught by the Mathematics department and consequently are not subject to the School’s assessment mechanisms. The Subject Area Coordinator’s report thus addresses COT 3402 and COP 4555 only. Because of the coupling of the concepts presented in these classes, a combined recommendation is given.

#### COT 3420 Logic for Computer Science

*In 2007, Alex Pelin taught four sections of COT 3420 and Ana Pasztor taught two. In their assessments, both express dissatisfaction with students’ mathematical preparation, noting that students are weak at abstract thinking and proofs. Alex suggests that a large pool of tutors might help. Ana proposes that we create a new class specifically on induction and recursion, because these are foundational topics in computer science.*

*In the few student assessments submitted, around 70% agree (strongly or moderately) that the course outcomes are valuable and covered adequately; a number of students do seem to feel that more time should be spent on specifying problems in first-order logic and on Prolog. There were a number of thoughtful student comments. One student suggests that MAD 2104 should emphasize proof by induction to better prepare students for COT 3420. Another would prefer that more emphasis be given to applications, to better motivate the theory.*

#### COP 4555 Principles of Programming Languages

*In 2007, Geoff Smith taught two sections of COP 4555 and Peter Clarke taught one, which was in Jamaica. In his appraisals, Geoff is satisfied with the students, but does note problems with attendance and tardiness. Regarding the long-standing question of a suitable textbook, Geoff is hopeful that the improved notes on his Moodle web site are*

now sufficient. In his appraisal of the Jamaica class, Peter suggests that COT 3420 should be a prerequisite, and notes that the compressed weekend format does not give students enough time to master the course material.

In the few student assessments submitted, around 90% agree (strongly or moderately) that the course outcomes are valuable and covered adequately. Only 65% of the students agree (strongly or moderately) that the textbook is adequate, however, suggesting that more improvement is needed in the on-line notes. In their comments, several students say that they like the Moodle site and its on-line resources, and several students make a number of thoughtful suggestions for improving the notes; Geoff should follow them.

#### Combined Recommendations for MAD2104, COT3420 and COP4555

The three courses MAD 2104, COT 3420, and COP 4555 all deal heavily with induction and recursion. It would seem beneficial to make an effort to coordinate these three classes so that they better support one another. MAD 2104 is taken first, and I would suggest that it should aim not for broad (and therefore shallow) coverage of many topics, but rather should aim to develop mathematical maturity by emphasizing formal definitions, abstract reasoning, and proofs. The relationship between COT 3420 and COP 4555 should be considered carefully. COP 4555 teaches programming with recursion through a "Checklist" which is really an informal proof by induction that the program is correct. It might be that the Checklist gives concrete intuitions about induction that would help in understanding the more formal treatment of structural induction given in COT 3420. So perhaps COP 4555 should be taken before COT 3420. On the other hand, Peter suggests that COT 3420 should be a prerequisite for COP 4555. I think it would be valuable for the teachers of these courses to discuss how these courses fit together in the curriculum, and to establish a preferred course sequence.

#### Subject Area: Programming (Reported by Bill Kraynek)

COP 2210 Computer Programming 1  
COP 3337 Computer Programming 2  
COP 3530 Data Structures  
COP 4338 Computer Programming 3

COP 2210 Computer Programming 1

*All objectives are covered on an assignment and/or an exam.*

*All objectives are considered essential or appropriate.*

*All objectives were covered extensively or adequately.*

*Most of the instructors thought that the student's preparation for taking the course was adequate.*

*An instructor thinks that college algebra should be a prerequisite*

*An instructor thinks that documentation standards should be one of the objectives.*

#### Recommendation:

*Since this course is primarily for computer science majors we should require a passing grade in college algebra.*

COP 3337 Computer Programming 2

*All objectives are covered on an assignment and/or an exam..*

*All objectives are considered essential or appropriate.*



*All objectives were covered extensively or adequately except one instructor was not able to cover the Java Collections Interface enough*

*All prerequisite objectives were useful or highly useful.*

*One instructor thought that the students in his section had prerequisite deficiencies in Programming I especially Strings & ArrayLists..*

*Recommendation:*

*Programming I instructors should be strongly encouraged to cover all of the objectives for Programming I especially Strings and ArrayLists.*

COP 3530 Data Structures

*Nothing was reported by instructors for COP 3530*

COP 4338 Computer Programming 3

*All objectives were covered on an assignment and/or an exam*

*All objective were considered essential*

*All objectives were covered extensively*

*The relevance prerequisite objectives was rated highly useful*

*The mastery of prerequisite objectives was rated good*

*The preparation of the students was rated good*

Subject Area: Software Engineering (Reported by Peter Clarke)

CEN 4010 Software Engineering I

CEN 4015 Software Design and Development Project

CEN 4021 Software Engineering II

CEN 4010 Software Engineering I

*The instructors for the sections taught in the Spring, Summer, and Fall semesters reported that the course objectives were covered using a variety of evaluation methods including tests, assignments, and project presentations and project deliverables. All the course objectives were either extensively or adequately covered for the Spring, Summer and Fall semesters. The mastery of prerequisite topics in all the semesters was either good or adequate. There was some concern that the topics of software testing and software documentation were inappropriate for the course and hence not adequately covered. There was only one tool reported to have been used to evaluate the students in both sections for Spring CEN 4010 - the course project*

*Prerequisite Mastery: \_*

*Deficient in COP 3530 Data Structures.*

*Prerequisite Outcome Suggestions (Instructors):*

- Most projects involve a database. Few students indicated they had experience in the design and implementation of databases or in the ability to programmatically connect to a database. While not critical, since most figured it out, it would be helpful.*
- Jamaica section – the Friday/Sunday 5 weekend period was too short for the students to gain the full benefit of the course project.*
- In the Spring it appeared that the only form of evaluation used was the project, which covered all the outcomes. There were no exams.*
- The instructors for the Spring course (both sections) stated that although programming is highly useful for the course the students were deficient in their programming skills. In addition the instructors stated that the relevance of data structure was incidental to the course and the students' knowledge was non-existent.*
- The instructors for the Spring stated that use of UML and systems walkthroughs were inappropriate for the course. Systems walkthroughs were not covered in the course.*

*General Comments (Instructors):*

*This is an excellent course - and perhaps should be a two part course - part one - requirements analysis, specification, design and implementation - part two life cycle analysis, maintenance and testing and more. Testing topics, while covered, get the time crunch at the end of class.*

Recommendations:

- *There is a need to have students take a programming course that contains web-based programming and working with databases before taking CEN 4010.*
- *There is a need for more students to take part in the online surveys.*
- *There should be a meeting with new adjunct professors and the course area coordinator at the beginning of the semester to discuss the course outcomes and objectives.*

**CEN 4015 Software Design and Development Project**

*The instructors reported that the course objectives were covered using project deliverables and project presentations. All the course objectives were either extensively or adequately covered. The prerequisite topics were all relevant and the students displayed either good or adequate mastery of these topics.*

Recommendations:

*The class had one student so it was difficult to identify any improvements that can be made.*

**CEN 4021 Software Engineering II**

Recommendation:

*There is a need to resolve the issue of cross listing of CEN 4021 with CEN 5064 a graduate course. Some undergraduate students are finding it difficult.*

**C. Program Outcomes Survey by Graduating Students**

The Program Outcomes Survey is completed by students in the semester in which they expect to graduate. The student is asked to rate each of the program outcomes in respect of two criteria, attainment and relevance.

Attainment: *This program outcome has been met for me personally*

- |                              |                                 |
|------------------------------|---------------------------------|
| <i>5: I agree strongly</i>   | <i>2: I disagree somewhat</i>   |
| <i>4: I agree moderately</i> | <i>1: I disagree moderately</i> |
| <i>3: I agree somewhat</i>   | <i>0: I disagree strongly</i>   |

Relevance: *How meaningful do you consider this outcome to be for you personally?*

- |                                 |                                  |
|---------------------------------|----------------------------------|
| <i>5: Extremely meaningful</i>  | <i>2: Somewhat meaningless</i>   |
| <i>4: Moderately meaningful</i> | <i>1: Moderately meaningless</i> |
| <i>3: Somewhat meaningful</i>   | <i>0: Extremely meaningless</i>  |

The combined responses for spring and summer 2007 are shown in Appendix D and summarized in the following table. No data are available for the fall semester. The response rate to this survey is only marginally better than that of 2006 and therefore still merits urgent attention.

Summary of responses to the Graduating Student Survey Spring 07, Summer 07

12 Respondents

Program Outcomes

Outcome Attainment

Perceived Relevance

|   | <u>Averag</u><br><u>e</u> | <u>Percentag</u><br><u>e</u> | <u>Averag</u><br><u>e</u> | <u>Percentag</u><br><u>e</u> |
|---|---------------------------|------------------------------|---------------------------|------------------------------|
| a: Proficiency in foundation areas                  | 4.50                      | 90.00                        | 4.58                      | 91.60                        |
| b: Proficiency in core areas                        | 4.42                      | 88.40                        | 5.00                      | 100.00                       |
| c: Proficiency in problem solving                   | 3.92                      | 78.40                        | 4.83                      | 96.60                        |
| d: Proficiency in a programming language            | 4.58                      | 91.60                        | 4.67                      | 93.40                        |
| e: Understanding of social & ethical issues         | 4.17                      | 83.40                        | 4.42                      | 88.40                        |
| f: Ability to work cooperatively                    | 4.08                      | 81.60                        | 4.58                      | 91.60                        |
| g: Effective communication skills                   | 3.75                      | 75.00                        | 4.42                      | 88.40                        |
| h: Understanding the scientific method              | 3.50                      | 70.00                        | 4.25                      | 85.00                        |
| i: Familiarity with the arts, humanities, etc       | 3.92                      | 78.40                        | 3.42                      | 68.40                        |
| j: Experience state of the art computing facilities | 3.83                      | 76.60                        | 5.00                      | 100.00                       |
|   | ====                      | ====                         | ====                      | ====                         |
| Averages, Outcomes a - j                            | 4.07                      | 81.34                        | 4.52                      | 90.34                        |
|   | ====                      | ====                         | ====                      | ====                         |
| k: Success in applying for entry-level positions    | 2.42                      | 48.40                        | 4.92                      | 98.40                        |
| *k (Modified for 8 actual job applicants)           | 3.63                      | 72.50                        |                           |                              |
| l: Success in admission to graduate school          | 0.33                      | 6.60                         | 4.83                      | 96.60                        |
| *l (Modified for 2 actual grad school applicants)   | 2.00                      | 40.00                        |                           |                              |

\*k Modified to reflect only those (8) respondents who actually applied for employment

\*l Modified to reflect only those (2) respondents who actually applied to grad school

**Table 3: Attainment & Relevance of Program Outcomes - 2007**

Program outcomes relating to Computer Science curriculum

(a: CS foundation areas, b: CS core areas, c: problem solving, d: programming languages)

As might be expected, graduating students perceive the importance of these outcomes to be very high (91.6%, 100%, 96.6%, 93.4%). Except for outcome c, the students' attainment ratings for these areas generally match their expectations (90.00%, 88.40%, 78.40%, 91.60%). While the attainment levels all exceed the acceptance threshold of 75%, the measured response level of 78.40% for the problem solving outcome suggests that there is room for improvement in the attainment of this critical outcome.

Program outcomes relating to work environment skills

(e: social & ethical, f: ability to work cooperatively, g: effective communication skills)

These outcomes relate directly to the ability of our graduates to enter the workforce with adequate preparation for the social, ethical and interactive aspects of their jobs. Their importance is perceived as high (88.4%, 91.6%, 88.4%), though somewhat less than the importance attached to technical preparedness (above). Our graduates report that these outcomes are being met at acceptable levels (83.4%, 81.6%, 75%). Nonetheless, it should be noted that attainment of the communications skills outcome is perceived at the minimally acceptable level of 75%.

Program outcomes relating to non-computer science curriculum

(h: understanding the scientific method, i: familiarity with the arts & humanities)

Predictably, our graduating students attach somewhat lower importance (85%, 68.4%) to these outcomes. They report a less than acceptable level (70%) of attainment of the scientific method outcome, and an acceptable level (78%) of attainment of the arts and humanities outcome.

#### Outcome j: Experience state-of-the-art computing facilities

The survey results show that the attainment level on this outcome is significantly below its perceived level of importance, 76.6% compared to 100%. It should be noted that the 76% attainment level represents a continued increase over the levels of preceding years, 68.6% in 2005 and 71.6% in 2006. It is now above our 75% threshold acceptance level, but clearly some students believe that this is a highly important aspect of their education that is not fully meeting their expectations. We should continue to ensure that the computing environments provided for our students do not fall short of realistic expectations,

#### Outcome k: Success in applying for entry-level positions

The aggregate method of reporting here does not yield a meaningful statistic. 3 students report that they have not yet applied for employment. Of the 8 students reporting that they have applied, 1 reports two or more good offers, and 5 report one suitable offer; 2 others have not yet received offers. This evidence suggests that our students are employable when just out of school, but the timing of the exit survey is probably too early to allow a complete assessment.

#### Outcome l: Success in admission to graduate school

Only 2 of 11 respondents indicate that they had applied for admission to graduate programs, both applications still pending. It is not possible to draw any inferences from this statistic.

#### Overall Student Satisfaction

Table 3 shows the averages of student responses to their perceived relevance and perceived attainment of outcomes a – j. Our students perceive the relevance of the program outcomes as very high, 90.34%. When the outcomes relating to employability and preparation for graduate school (98.4% and 96.6%) are factored in, the relevance is perceived at even higher levels. Clearly, our students believe that the BS program outcomes are highly relevant. Their perceptions of attainment of the program outcomes are at lower levels than their perceptions of relevance, 81.4% to 90.34%. The 81.4% attainment level is healthy, but reasonably suggests that SCIS can do better to realize attainment of the outcomes.

*Recommendation:* In practice, the outcomes relating to *communication skills*, the *scientific method* and familiarity with the *arts and humanities* are outside the scope of our direct influence. Nonetheless, SCIS should engage in dialog with the units delivering required courses in these areas to ensure, to the degree possible, relevance and accessibility for our students. We can also seek to incorporate elements of these areas into the courses which we deliver.

*Recommendation:* As expected, our students ascribe highest relevance to those outcomes that are directly under our influence. In particular, the survey clearly indicates that there is room for improvement in the following area

- *Proficiency in problem solving.* This can be reinforced in all of our course offerings. It may be necessary to revise course outcomes and/or syllabi.
- *Effective communication skills.* Where possible, these elements must be strengthened or incorporated into our courses to afford graduates the facility they need when entering the workforce.

*Recommendation:* The data collected at the time of graduation is inconclusive and not helpful in evaluating attainment of outcomes k and l (employment, grad-school). It would be useful to implement a system of tracking our graduates in the workforce, perhaps by maintaining a “who’s who” of our graduates.

## D. Program Objectives Survey by Alumni

The Alumni survey of the school's program objectives was initiated in 2004, and has been available on a continuing basis. Respondents are asked to rate the contribution of their educational experience at FIU to their personal growth, capacity for life-long learning, communication skills, social and ethical awareness, career preparation, and preparation for graduate study. Respondents also rate the CS curriculum and CS faculty on several criteria, and the School's environment in terms of diversity and tolerance. The respondents also provide "overall" ratings of their FIU experience, the CS faculty, their preparation at graduation, diversity and environment, and the BS\_CS program. Responses are on a 4-point scale with: 4: excellent, 3: good, 2: satisfactory, 1: poor and 0: unsatisfactory

| <u>Summary of Alumni Survey of Program Objectives</u> |   | 129 Respondents           |                   |
|---|---|---------------------------|-------------------|
| <u>Cumulative through 12/2007</u>                     |   | <u>Outcome Attainment</u> |                   |
| <u>BS-CS</u>  | <u>Program Objective</u>                    | <u>Average</u>            | <u>Percentage</u> |
| 1   | Capacity for personal growth                | 3.36                      | 84.00             |
| 1   | Capacity for life-long learning             | 3.45                      | 86.25             |
| 3   | Development of communication skills         | 2.91                      | 72.75             |
| 3   | Social & ethical responsibility             | 2.96                      | 74.00             |
| 4   | Preparation for a career in CS              | 3.18                      | 79.50             |
| 4   | Preparation for graduate study              | 3.08                      | 77.00             |
| 6   | Expertise of faculty in their subject areas | 3.39                      | 84.75             |
| 6   | Dedication of faculty to teaching           | 3.18                      | 79.50             |
| 6   | Mentorship provided by the faculty          | 2.78                      | 69.50             |
| 6   | Overall Instructional capability of faculty | 3.24                      | 81.00             |
| 2   | Computer Programming                        | 3.36                      | 84.00             |
| 2   | Systems Development                         | 2.82                      | 70.50             |
| 2   | Data Structures & Algorithms                | 3.29                      | 82.25             |
| 2   | Computer Architecture & Organization        | 2.95                      | 73.75             |
| 5   | Maintaining diverse student population      | 3.42                      | 85.50             |
| 5   | Diversity as an agent for personal growth   | 3.07                      | 76.75             |
| 5   | Diversity as an agent for social awareness  | 2.95                      | 73.75             |
| 5   | Maintaining a healthy learning environment  | 3.27                      | 81.75             |
| all   | Overall FIU educational experience rating   | 3.16                      | 79.00             |
| 6   | Overall faculty & instruction rating        | 3.15                      | 78.75             |
| 4   | Overall preparation upon graduation         | 3.10                      | 77.50             |
| 4   | Overall rating of diversity and environment | 3.18                      | 79.50             |
| all   | Overall satisfaction with BS-CS program     | 3.15                      | 78.75             |

**Table 4: Alumni Survey of Program Objectives**

Table 4, above, summarizes the responses to this survey as of December 2007. The table shows the weighted averages of the responses to each survey item, as a raw score from a maximum of 4, and as a percentage. Detailed survey results are available in Appendix E.

The current count of 129 respondents represents an increase of only 5 over the count of 124 for the previous review period. Table 5 provides a quick comparison of the 2005, 2006 and 2007 “overall” ratings. As might be expected, the current response scores are virtually indistinguishable from those of previous reports.

| Year | FIU<br>Educational<br>Experience | Faculty<br>&<br>Instruction | Preparation<br>At<br>Graduation | Diversity<br>&<br>Environment | Satisfaction<br>With<br>BS_CS |
|------|----------------------------------|-----------------------------|---------------------------------|-------------------------------|-------------------------------|
| 2007 | 79.00                            | 78.75                       | 77.50                           | 79.50                         | 78.75                         |
| 2006 | 78.75                            | 78.75                       | 77.75                           | 79.25                         | 78.85                         |
| 2005 | 78.75                            | 79.00                       | 77.50                           | 79.25                         | 78.75                         |

**Table 5: Comparison of Overall Ratings, 2005 - 2007**

We conclude that the BS-CS program objectives continue to be met at acceptable levels.

## IV. RECOMMENDATIONS FROM OTHER CONSTITUENTS

### A. ACM Student Chapter

The FIU ACM Student Chapter report indicates another vigorous year of professional, social, and community activities. The following is excerpted from their report...

*In general, the Fall 2007 semester was marked by a renewed interest in programming competitions. This was probably due to the extensive time and effort put into training a core group of competition team members between May and October 2007. The net result has been that we now have a core group of 8-10 leaders who have taken on an increasing amount of responsibility in running the organization. Secondly, supported by visits from software companies, the ACM club leadership has been actively campaigning for great awareness among students about applying for internships and joining departmental research groups. The establishment of a shared lounge area for student clubs in January 2008 has helped to improve the coordination among student leaders, and promises to be an effective aid to recruiting new student members.*

Reported activities include the following

- *ACM Southeast Regional Programming Competition*
- *Fourth Annual High-School Programming Competition*
- *Undergraduate Programming Competition*
- *Volunteer Tutoring Program*
- *Guest Lecture: Jose Alvarez*
- *Ultimate Software*
- *Student Picnic*
- *Robotics Special Interest Group*
- *Graphics and Games Special Interest Group.*
- *ASP.NET Training Seminars*
- *Competition Problem Solving Workshops*

There are no recommendations offered by ACM this year. The full report is included here as Appendix F.



## **B. Women In Computer Science Group**

The WICS group continued its unique mission of nurturing. Their report documents several events designed to promote the confidence and success of its members in a male-dominated discipline, including motivational presentations by prominent and successful professional women. The group also continued its tradition of social involvement through contributions to Lotus House (for homeless women) and the Miami rescue Mission. They continued their tradition of providing free tutoring sessions throughout the year.

There are no recommendations from WICS this year. The full report is included here as Appendix G.

## **C. Industry Advisory Board**

The involvement of the Industry Advisory board has continued to grow in 2007 with considerable impact on the School's extra-curricular programs, and as an invaluable avenue for our students into the professional world.

A summary of the activities of the Industrial Advisory Board during 2007 is included here as Appendix H. Highlights include

- Successfully recruited seven new members from key CS/IT areas
- Our partnership with IBM has grown significantly
- FIU's NSF Industry/University Collaborative Research Center
- Assisting the School to develop a regional Business Continuity Information Network
- Actively participating in our grant funding efforts
- Board members from IBM, Motorola Board, Siemens Networks, gave lectures
- Many Board member companies conducted coordinated recruitment of our students

## V. ASSESSMENT

### A. Program Outcomes

The principal means of assessing the relevance and degree of attainment of the program's outcomes is the Program Outcomes Survey (or Exit Survey) completed by students in the semester in which they graduate. In addition, the Course Outcomes Survey by Students and by the Course Outcomes Survey by Instructors provide additional indicators of the curriculum-specific program outcomes. The responses to these three surveys have been reported and analyzed under the corresponding headings in section III of this report. In this section, we summarize the findings and recommendations from those surveys.

#### Course Outcomes Survey by Students

The overall annual course outcomes rating, averaged over all sections of all courses, are at very high levels (See Table 1).

|                                  |                                |
|----------------------------------|--------------------------------|
| Perceived value of the outcomes: | 4.47 on a scale of 5, or 89.0% |
| Perceived adequacy of coverage:  | 4.21 on a scale of 5, or 84.4% |

COP 2210: There is a concern about the suitability of the textbook.

COP 4555: There is a continuing concern about the textbook.

CDA 4101: Students expressed the opinion that the assigned homework is insufficient

#### Course Outcomes Survey by Instructors

##### Communications & Ethics

CGS 3092: Recommendation to reconsider the prerequisites

##### Computer Systems

CDA 4101: Concern about adequacy of coverage of shared memory and MPI

CNT 4513: Recommendation concerning the textbook

COP 4225: Recommendation for extending the term project

COP 4610: Recommendation to modify the course outcomes

##### Foundations

MAD 2104: Recommendation to reconsider the syllabus

COT 3420: Recommendation to reconsider the syllabus

COP4554: Recommendation to reconsider the syllabus

##### Programming

COP 2210: Recommendation to consider College Algebra as a prerequisite

COP 3337: Concern about inadequate prerequisite coverage

##### Software Engineering

CEN 4010: Concerns about adequacy of the prerequisites

CEN 4010: Concern about some administrative aspects  
 CEN 4021: Recommendation to reconsider cross-listing with the graduate course

Program Outcomes Survey by Graduating Students (Exit Survey)

The Overall Student CS Satisfaction level reported is 4.44 on a scale of 5, or 88.8%.

There are minor concerns of marginally acceptable levels of attainment of the outcomes relating to understanding the scientific method, and familiarity with the arts and humanities.

There are concerns concerning perceived attainment levels of the outcomes relating to proficiency in problem solving, and effective communication skills.

There is a continuing major concern about the response rate to this particular survey. It is unacceptably low. It is imperative to increase the response rate to this particular survey if the survey results are to have any significance. In addition, this assessment might be strengthened by adoption of some direct assessment strategy(s).

There is a recommendation to collect employment history data on our graduates.

**B. Program Objectives**

The principal means of assessing attainment of the program objectives is the Alumni Survey of Program Objectives. Table 4 summarized the responses on attainment of specific objectives. The alumni also provide “overall” ratings for the objectives. The results of this part of the survey are summarized in Table 5 and compared with the responses from the previous annual reports. That table is reproduced here for ease of reference and additionally indexed to the specific program objectives.

| Year | FIU Educational Experience | Faculty & Instruction | Preparation At Graduation | Diversity & Environment | Satisfaction With BS_CS |
|------|----------------------------|-----------------------|---------------------------|-------------------------|-------------------------|
|      | <b>Objectives 1, 2, 3</b>  | <b>Objective 6</b>    | <b>Objectives 2, 3, 4</b> | <b>Objective 5</b>      | <b>ALL Objectives</b>   |
| 2007 | 79.00                      | 78.75                 | 77.50                     | 79.50                   | 78.75                   |
| 2006 | 78.75                      | 78.75                 | 77.75                     | 79.25                   | 78.85                   |
| 2005 | 78.75                      | 79.00                 | 77.50                     | 79.25                   | 78.75                   |

**Table 6: Attainment of BS-CS Program Objectives**

Additionally, the other interest groups within the SCIS umbrella, WICS, ACM, IAB provide valuable indicators of the attainment of the program objectives.

**Objective-1:** To provide our graduates with a broad-based education that will form the basis for personal growth and life-long learning.

Indicators:

- 1) *Capacity for personal growth – 84.00%*
- 2) *Capacity for life-long learning – 86.25%*
- 3) *Activities of the WICS & ACM groups – Very Good*

Conclusions

This objective is being met at a very high level. The activities of the ACM chapter and WICS are highly significant contributors to this area of our students' development.

Recommendations

None.

**Objective-2:** To provide our graduates with a quality technical education that will equip them for productive careers in the field of Computer Science.

Indicators:

- 1) *Preparation upon graduation in the areas of*
  - Computer Programming – 84.00%
  - Systems Development – 70.50%
  - Data Structures and Algorithms – 82.25%
  - Computer Architecture and Organization – 73.75%

Conclusions

This objective is being met. However, the indicators for both the Systems Development and Computer Architecture and Organization areas remain below 75%. In addition, the outcome *Proficiency in problem-solving* scored at a marginally acceptable level in the graduating student survey. Problem-solving is the essence of the computer science discipline. Student attainment of this objective must be elevated.

Recommendation

- 1) The subject Area Coordinator for Computer Systems has given an analysis of the courses in this area. There are very specific recommendations for CDA 4101 and COP 4610. These are core areas of the Computer Science curriculum and the deficiencies must be addressed with some urgency.
- 2) The perceived relative weakness in problem-solving must be addressed immediately and vigorously. The outcomes of all required CS courses must be considered and, where meaningful, course syllabi revised to ensure that our graduates are confident in their ability to practice their craft.

**Objective-3:** To provide our graduates with the communication skills and social and ethical awareness requisite for the effective and responsible practice of their professions.

Indicators

- 1) *Development of communication skills – 72.75%*

2) *Awareness of social and ethical responsibility* – 74.00%

Conclusions

This objective is being met, but should be strengthened.

Recommendations

The communication skills courses ENC 3211 and COM 3011 are taught by other instructional units. More opportunities for application of communication skills should be incorporated into the computer science curriculum, together with appropriately documented evaluation metrics and feed-back mechanisms.

**Objective-4:** To prepare students for BS level careers or continued graduate education.

Indicators

- 1) *Preparation for a career in computer science* – 79.50%
- 2) *Preparation for graduate study* – 77.00%
- 3) *Initiatives of the Industry Advisory Board* – *Extremely significant*

Conclusions

The objective is being met. This is strongly supported by the anecdotal data (see the IAB report). However, the available data, while suggesting attainment, is inconclusive.

Recommendations

Refer to Section III C. Program Outcomes Survey by Graduating Students.

**Objective-5:** To maintain a diverse student population and actively promote an environment in which students from all groups, including the traditionally under-represented, may successfully pursue the study of Computer Science.

Indicators

- 1) *Maintaining diverse student population* – 85.50%
- 2) *Diversity as an agent for personal growth* – 76.75%
- 3) *Diversity as an agent for social awareness* – 73.75%
- 4) *Healthy learning environment* – 81.75%
- 5) *Overall rating of diversity and environment* – 79.50%
- 6) *Activities of the WICS & ACM groups* - *Outstanding*

Conclusions

This objective is being met. The activities of the WICS group contribute substantially to our attainment in this area. Our high ranking in production of minority graduates further substantiates attainment of this outcome.

Recommendations

None.

**Objective-6:** To maintain a qualified and dedicated faculty who actively pursue excellence in teaching.

Indicators

- 1) *Expertise of faculty in their subject areas* – 84.75%
- 2) *Dedication of faculty to teaching* – 79.50%
- 3) *Mentorship provided by the faculty* – 69.25%
- 4) *Overall instructional capability of the faculty* – 81.00%

Conclusions

This objective is being met.

Recommendations

SCIS faculty should be encouraged to elevate their mentorship roles.

## VI. CONCLUSIONS

This report has considered indicators from the alumni, students and faculty of our School. The reports from our other constituents including our student organizations and the Industry Advisory Board indicate substantial and meaningful impact on our School's accomplishments during 2007, and are therefore important components of our assessment process.

The outcomes and objectives of the BS in Computer Science program continue to be perceived as highly relevant.

Responses received from current and graduating students provide reasonable evidence that the program outcomes and objectives are attained at reasonable levels. Nonetheless, there are strong indicators that some areas of our program merit ameliorating or corrective attention at this point in time. This report therefore presents several recommendations for maintaining excellence in our BS in Computer Science program.

Feedback from alumni, vigorous activity of the WICS and ACM chapter, and a strongly engaged Industry Advisory Board clearly indicate attainment of our objectives, and reaffirm the School's commitment to its mission.

## VII. APPENDICES



## Appendix A:

### SCS Assessment Plan

#### 1) Curriculum Committee

##### a) The Assessments Coordinator

- Convenes and chairs meetings of the curriculum committee.
- Directs and oversees the overall assessment activities of the school.
- Reports curriculum committee findings to the director and faculty of the school.
- Directs implementation of curriculum modifications.
- Represents the school on the College curriculum committee. (May delegate.)
- Monitors the BS program for compliance with accreditation criteria.
- Prepares program assessment documentation required by the accreditation bodies.

##### b) The Subject Area Leaders

- Maintain common syllabus and requirements for each course in a subject area.
- Interpret semester course evaluations to assess specific course outcomes.
- Report findings and recommendations to the curriculum committee.

The Assessments Coordinator is appointed by the SCS Director.

The Subject Area Leaders may be appointed or elected by the faculty.

Programming: COP 2210, COP 3337, COP 3530, COP 4338, COP 4555.

Software Engineering: CEN 4010, CEN 4015, CEN 4021.

Computer Systems: COP 3402, CDA 4101, COP 4610, Non-math Electives.

Foundations: MAD 2104, COT 3420, MAD 3512, Math Electives.

Communication & Ethics: ENC 3211, CGS 3092.

Science: PHY 2048/9, Science Electives

The Assessments Coordinator and Subject Area Leaders for programming, software engineering, computer systems and foundations constitute the Curriculum Committee.

The Coordinator should not simultaneously be a Leader of any of the first four subject areas, but may lead the Communications and Science areas.

#### 2) Assessment Activities

- a) Course Outcomes: 1) A *student survey* and 2) an *instructor appraisal* are conducted towards the end of each semester in which a course is offered. The survey results and instructor appraisal are considered by the Subject Area Leader and Assessments Coordinator and reported to the Curriculum Committee for consideration. Adjustments not requiring syllabus change may be effected as soon as the following semester. The Curriculum Committee meets at the start of each semester to consider syllabus modifications recommended by the Subject Area Leader and/or Assessments Coordinator. On the recommendation of the Curriculum Committee, the faculty may consider modifications to the syllabus. 3) *Other assessment strategies* that may be considered include student portfolios, prerequisite tests and common finals.
- b) Program Outcomes: 1) A *graduating student survey* is conducted towards the end of each semester. The results of this survey and of the relevant course outcomes surveys are considered by the Curriculum Committee, meeting at the start of each semester. 2) *Other assessment strategies* that may be considered are an exit exam, student portfolios, capstone course.

- c) Program Objectives: 1) An *alumni survey* is conducted annually on a 3-year cycle. 2) The *industrial advisory board* meets annually. 3) A *student interest group* meets in the Fall and Spring semesters. 4) *Other assessment strategies* that may be considered are student focus groups, employers survey.

**3) Defining and Implementing Improvements**

The Curriculum Committee meets routinely at the start of each semester. Additional meetings may be called as may be deemed necessary by the Assessments Coordinator.

- 1) Curriculum adjustments indicated by the course outcomes assessment of the previous semester are considered at the first semester meeting.
- 2) Results of the program outcomes and program objectives assessments should be considered at the soonest possible opportunity taking into account College curriculum committee deadlines.
- 3) Recommendations for program adjustments must be approved by the faculty.

## Appendix B:

### ***BS Program Objectives***

1. To provide our graduates with a broad-based education that will form the basis for personal growth and life-long learning.
2. To provide our graduates with a quality technical education that will equip them for productive careers in the field of Computer Science.
3. To provide our graduates with the communication skills and social and ethical awareness requisite for the effective and responsible practice of their professions.
4. To prepare students for BS level careers or continued graduate education.
5. To maintain a diverse student population and actively promote an environment in which students from all groups, including the traditionally under-represented, may successfully pursue the study of Computer Science.
6. To maintain a qualified and dedicated faculty who actively pursue excellence in teaching.

### ***BS Program Educational Outcomes***

To complete the program of study for the BS in Computer Science, every student will

- a) Demonstrate proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic and the theory of algorithms.
- b) Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.
- c) Demonstrate proficiency in problem solving and application of software engineering techniques.
- d) Demonstrate mastery of at least one modern programming language and proficiency in at least one other.
- e) Demonstrate understanding of the social and ethical concerns of the practicing computer scientist.
- f) Demonstrate the ability to work cooperatively in teams.
- g) Demonstrate effective communication skills.
- h) Demonstrate understanding of the scientific method.
- i) Demonstrate familiarity with fundamental ideas and issues in the arts, humanities and social sciences.
- j) Have experience working in state-of-the-art computing environments.
- k) Be successful in applying for computer science related entry-level positions in business, industry or government.
- l) [*Computer Science track graduates*] Be successful in gaining admission to graduate programs in Computer Science.

Appendix C:

## **SCHOOL OF COMPUTER SCIENCE ASSESSMENT MECHANISMS AND PROCEDURES**

### **I. INTRODUCTION**

The School of Computer Science at Florida International University uses many different assessment mechanisms to assess the extent to which its undergraduate program objectives are being met. Further, the School has defined procedures to evaluate the assessment results and identify ways to improve its curriculum deemed necessary and appropriate by its faculty.

SCS currently uses four survey instruments:

- Course Outcomes Survey by Students for each course
- Course Outcomes Survey by Instructors for each course
- Survey of graduating students
- Survey of alumni

In addition to these survey instruments, we seek recommendations from other important sources including the Industrial Advisory Board of the School, undergraduate women's group, ACM student chapter, and the like. We will reevaluate these recommendation mechanisms in the future and design survey mechanisms for individual constituencies if so warranted.

### **II. ADMINISTRATIVE STRUCTURE**

To administer and evaluate these assessments, the School has created the administrative structure that includes the undergraduate program director (UPD), the assessments coordinator (AC), and five subject area coordinators (SAC), each in-charge of courses in a specific subject area. The Director of the School appoints the UPD, and the UPD is responsible for appointing the AC and the SACs.

The five subject areas are Programming, Software Engineering, Computer Systems, Foundations, and Communication & Ethics. The SACs are responsible for writing periodic recommendations for modifications pertaining to all courses in their respective subject areas. The AC is responsible for writing a periodic report summarizing these recommendations of the SACs and the recommendations received from other sources. This report is submitted to the curriculum committee of the School which then follows the normal academic procedures of the university to implement the modifications suggested. The UPD bears the overall responsibility for assessing the undergraduate programs of the School as well as ascertaining that defined procedures are followed in a timely fashion.

### **III. ASSESSMENT INSTRUMENTS AND PROCEDURES**

As indicated earlier, the School uses both, the survey instruments and recommendation from identified groups to assess whether its program objectives are being met. The details of these assessment mechanisms and how we plan to use them are described below.

## **A. SURVEY INSTRUMENTS:**

### **1) COURSE OUTCOMES SURVEYS:**

There are two bodies that conduct the course outcomes surveys, students taking the courses and faculty members teaching them.

#### **a) By Students:**

This survey is undertaken by current students for each of their classes every term. Each student is asked to rate the appropriateness of each of the outcomes for the course from two points of views: the level to which the outcome was met for the student personally and how meaningful the student considers the outcome. The survey is conducted on-line during the last two weeks of each term.

#### **b) By Instructors:**

Instructors of each of the courses complete this survey that includes which assignments, quizzes, tests, etc. covered which of the course objectives, how do they rate the appropriateness of each of these objectives, how effectively were they able to address that objective, how relevant they think each of the outcomes of the prerequisite course(s) is, what was the level of mastery of students in their prerequisite topics, and their suggestions about improving the overall preparation of the students for taking that course. The instructors complete this survey on-line within a week of the completion of the term.

The Associate Director for Computing Technologies is responsible for ascertaining that meaningful statistics for each survey are available within a month after the term concludes.

Each SAC is responsible for reviewing these survey results for all courses in the subject area, and write an annual report recommending possible modifications, if any. The AC must receive these reports by the end of January, that is, by the end of the first month of the Spring term. The AC then summarizes and consolidates these recommendations in one report that must be submitted to the School's curriculum committee by the end of February of each year.

### **2) SURVEY OF GRADUATING STUDENTS:**

This survey, undertaken by students who are ready to graduate with the undergraduate degree in Computer Science, is conducted in an on-line fashion every term. All graduating students are asked to rate every outcome of our degree program as to the extent it has been met for them personally as well as how meaningful they consider it to be for them personally. The students are also asked to give their suggestions to improve our undergraduate curriculum. The survey will be conducted on-line.

We will use the results of this survey to modify our curriculum appropriately to ascertain that students have a smooth learning experience as they progress through their curriculum. Curriculum modifications based on students' comments will be proposed by the AC in the annual report submitted to the curriculum committee by the end of February.

### 3) SURVEY OF ALUMNI:

This survey undertaken by our graduates is conducted every three years. Its primary purpose is to allow us to get the feedback from our graduates as to how adequately our curriculum has prepared them to achieve success in their current practices, either advanced graduate studies or employment in any computing industry or government. The survey will be conducted in an on-line fashion.

We will use the results of this survey to modify our curriculum contents to prepare our students better to maximize their potential to achieve success. The AC is responsible to include curriculum modifications based on the alumni survey in the annual report submitted to the curriculum committee.

## **B. RECOMMENDATIONS:**

Periodically, we seek out recommendations for curricular changes from diverse bodies and interest groups. In all cases, curriculum modifications based on these recommendations will be included in the annual report submitted by the AC to the School's curriculum committee.

### 1) Industrial Advisory Board:

The IAB of the School is expected to meet once a year to discuss among other things, how we can prepare our students better to face the current challenges in the field. The Director of the School, the UPD, and the AC will review these formal and informal recommendations of the Board.

### 2) Undergraduate women's forum:

Our undergraduate women's forum meets occasionally throughout the year under the leadership of a faculty member of the School. The problems faced by women in science areas of endeavor are unique, and we will take the recommendations of this group to address their concerns about our curriculum and how can we assist them to perform better and attract more women in our program. The AC and the UPD will review the recommendations of the group on an annual basis.

### 3) ACM Student Chapter:

The members of our ACM Student Chapter meet periodically throughout the year. Recommendations made by this group through their faculty advisor will be reviewed by the AC and the UPD on an annual basis.

## **IV. IMPLEMENTING CURRICULUM CHANGES:**

The annual written report submitted by the Assessments Coordinator to the curriculum committee of the School by the end of February includes recommended curriculum modifications based on all assessment mechanisms. The curriculum committee will complete all internal deliberations in the School by the end of the Spring semester so that the faculty approved changes in our curriculum can be submitted to the College Curriculum Committee's first meeting in the Fall semester. The University approved curriculum modifications will be implemented no later than in the subsequent Fall term.

## FIU - School of Computing and Information Sciences CS Exit Survey

[Home](#)[Logout](#)

First Survey: 04-24-2007 06:06:57 PM

Final Survey: 12-04-2007 10:20:35 PM

### Current Data + Spring 2007 - Summer 2007

#### Outcome a: Students will demonstrate proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic and the theory of algorithms

| <i>This program outcome has been met for me personally</i> |             | <i>* How meaningful do you consider this outcome to be for you personally?</i> |             |
|--|-------------|--|-------------|
| A-5 I agree strongly                                       | 8 (66.67%)  | A-5 Extremely meaningful   | 9 (75.00%)  |
| B-4 I agree moderately                                     | 2 (16.67%)  | B-4 Moderately meaningful  | 2 (16.67%)  |
| C-3 I agree somewhat                                       | 2 (16.67%)  | C-3 Somewhat meaningful  | 0 (0.00%)   |
| D-2 I disagree somewhat                                    | 0 (0.00%)   | D-2 Somewhat meaningless   | 1 (8.33%)   |
| E-1 I disagree moderately                                  | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 I disagree strongly                                    | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>  | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>  | <b>4.50</b> | <b>Avg:</b>  | <b>4.58</b> |
| <b>Std Dev:</b>  | <b>0.76</b> | <b>Std Dev:</b>  | <b>0.86</b> |

#### Outcome b: Students will demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems

| <i>This program outcome has been met for me personally</i> |             | <i>* How meaningful do you consider this outcome to be for you personally?</i> |              |
|--|-------------|--|--------------|
| A-5 I agree strongly                                       | 6 (50.00%)  | A-5 Extremely meaningful   | 12 (100.00%) |
| B-4 I agree moderately                                     | 5 (41.67%)  | B-4 Moderately meaningful  | 0 (0.00%)    |
| C-3 I agree somewhat                                       | 1 (8.33%)   | C-3 Somewhat meaningful  | 0 (0.00%)    |
| D-2 I disagree somewhat                                    | 0 (0.00%)   | D-2 Somewhat meaningless   | 0 (0.00%)    |
| E-1 I disagree moderately                                  | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)    |
| F-0 I disagree strongly                                    | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)    |
| <b>Total:</b>  | <b>12</b>   | <b>Total:</b>  | <b>12</b>    |
| <b>Avg:</b>  | <b>4.42</b> | <b>Avg:</b>  | <b>5.00</b>  |
| <b>Std Dev:</b>  | <b>0.64</b> | <b>Std Dev:</b>  | <b>0.00</b>  |

#### Outcome c: Students will demonstrate proficiency in problem solving and application of software engineering techniques

| <i>This program outcome has been met for me personally</i> |             | <i>* How meaningful do you consider this outcome to be for you personally?</i> |             |
|--|-------------|--|-------------|
| A-5 I agree strongly                                       | 6 (50.00%)  | A-5 Extremely meaningful   | 11 (91.67%) |
| B-4 I agree moderately                                     | 2 (16.67%)  | B-4 Moderately meaningful  | 0 (0.00%)   |
| C-3 I agree somewhat                                       | 3 (25.00%)  | C-3 Somewhat meaningful  | 1 (8.33%)   |
| D-2 I disagree somewhat                                    | 0 (0.00%)   | D-2 Somewhat meaningless   | 0 (0.00%)   |
| E-1 I disagree moderately                                  | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 I disagree strongly                                    | 1 (8.33%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>  | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>  | <b>3.92</b> | <b>Avg:</b>  | <b>4.83</b> |
| <b>Std Dev:</b>  | <b>1.44</b> | <b>Std Dev:</b>  | <b>0.55</b> |



| <b>Outcome d: Students will demonstrate mastery of at least one modern programming language and proficiency in at least one other</b> |             |  |             |
|---|-------------|--|-------------|
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>* How meaningful do you consider this outcome to be for you personally?</i></b>  |             |
| A-5 I agree strongly  | 10 (83.33%) | A-5 Extremely meaningful   | 10 (83.33%) |
| B-4 I agree moderately  | 0 (0.00%)   | B-4 Moderately meaningful  | 0 (0.00%)   |
| C-3 I agree somewhat  | 1 (8.33%)   | C-3 Somewhat meaningful  | 2 (16.67%)  |
| D-2 I disagree somewhat   | 1 (8.33%)   | D-2 Somewhat meaningless   | 0 (0.00%)   |
| E-1 I disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 I disagree strongly   | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>   | <b>4.58</b> | <b>Avg:</b>  | <b>4.67</b> |
| <b>Std Dev:</b>   | <b>0.95</b> | <b>Std Dev:</b>  | <b>0.75</b> |
| <b>Outcome e: Students will demonstrate understanding of the social and ethical concerns of the practicing computer scientist</b>     |             |  |             |
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>* How meaningful do you consider this outcome to be for you personally?</i></b>  |             |
| A-5 I agree strongly  | 4 (33.33%)  | A-5 Extremely meaningful   | 7 (58.33%)  |
| B-4 I agree moderately  | 6 (50.00%)  | B-4 Moderately meaningful  | 4 (33.33%)  |
| C-3 I agree somewhat  | 2 (16.67%)  | C-3 Somewhat meaningful  | 0 (0.00%)   |
| D-2 I disagree somewhat   | 0 (0.00%)   | D-2 Somewhat meaningless   | 1 (8.33%)   |
| E-1 I disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 I disagree strongly   | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>   | <b>4.17</b> | <b>Avg:</b>  | <b>4.42</b> |
| <b>Std Dev:</b>   | <b>0.69</b> | <b>Std Dev:</b>  | <b>0.86</b> |
| <b>Outcome f: Students will demonstrate the ability to work cooperatively in teams</b>  |             |  |             |
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>How meaningful do you consider this outcome to be for you personally?</i></b>    |             |
| A-5 I agree strongly  | 5 (41.67%)  | A-5 Extremely meaningful   | 9 (75.00%)  |
| B-4 I agree moderately  | 5 (41.67%)  | B-4 Moderately meaningful  | 2 (16.67%)  |
| C-3 I agree somewhat  | 0 (0.00%)   | C-3 Somewhat meaningful  | 0 (0.00%)   |
| D-2 I disagree somewhat   | 2 (16.67%)  | D-2 Somewhat meaningless   | 1 (8.33%)   |
| E-1 I disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 I disagree strongly   | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>   | <b>4.08</b> | <b>Avg:</b>  | <b>4.58</b> |
| <b>Std Dev:</b>   | <b>1.04</b> | <b>Std Dev:</b>  | <b>0.86</b> |
| <b>Outcome g: Students will demonstrate effective communication skills</b>  |             |  |             |
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>** How meaningful do you consider this outcome to be for you personally?</i></b> |             |
| A-5 I agree strongly  | 4 (33.33%)  | A-5 Extremely meaningful   | 8 (66.67%)  |
| B-4 I agree moderately  | 3 (25.00%)  | B-4 Moderately meaningful  | 3 (25.00%)  |
| C-3 I agree somewhat  | 3 (25.00%)  | C-3 Somewhat meaningful  | 0 (0.00%)   |
| D-2 I disagree somewhat   | 2 (16.67%)  | D-2 Somewhat meaningless   | 0 (0.00%)   |
| E-1 I disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 1 (8.33%)   |
| F-0 I disagree strongly   | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>   |
| <b>Avg:</b>   | <b>3.75</b> | <b>Avg:</b>  | <b>4.42</b> |
| <b>Std Dev:</b>   | <b>1.09</b> | <b>Std Dev:</b>  | <b>1.11</b> |

| <b>Outcome h: Students will demonstrate understanding of the scientific method</b>  |             |  |              |
|---|-------------|--|--------------|
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>** How meaningful do you consider this outcome to be for you personally?</i></b> |              |
| A-5   agree strongly  | 4 (33.33%)  | A-5 Extremely meaningful   | 6 (50.00%)   |
| B-4   agree moderately  | 3 (25.00%)  | B-4 Moderately meaningful  | 4 (33.33%)   |
| C-3   agree somewhat  | 2 (16.67%)  | C-3 Somewhat meaningful  | 1 (8.33%)    |
| D-2   disagree somewhat   | 2 (16.67%)  | D-2 Somewhat meaningless   | 1 (8.33%)    |
| E-1   disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)    |
| F-0   disagree strongly   | 1 (8.33%)   | F-0 Extremely meaningless  | 0 (0.00%)    |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>    |
| <b>Avg:</b>   | <b>3.50</b> | <b>Avg:</b>  | <b>4.25</b>  |
| <b>Std Dev:</b>   | <b>1.50</b> | <b>Std Dev:</b>  | <b>0.92</b>  |
| <b>Outcome i: Students will demonstrate familiarity with fundamental ideas and issues in the arts, humanities and social sciences</b> |             |  |              |
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>** How meaningful do you consider this outcome to be for you personally?</i></b> |              |
| A-5   agree strongly  | 4 (33.33%)  | A-5 Extremely meaningful   | 2 (16.67%)   |
| B-4   agree moderately  | 4 (33.33%)  | B-4 Moderately meaningful  | 4 (33.33%)   |
| C-3   agree somewhat  | 3 (25.00%)  | C-3 Somewhat meaningful  | 4 (33.33%)   |
| D-2   disagree somewhat   | 1 (8.33%)   | D-2 Somewhat meaningless   | 1 (8.33%)    |
| E-1   disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 1 (8.33%)    |
| F-0   disagree strongly   | 0 (0.00%)   | F-0 Extremely meaningless  | 0 (0.00%)    |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>    |
| <b>Avg:</b>   | <b>3.92</b> | <b>Avg:</b>  | <b>3.42</b>  |
| <b>Std Dev:</b>   | <b>0.95</b> | <b>Std Dev:</b>  | <b>1.11</b>  |
| <b>Outcome j: Students will have experience working in state-of-the-art computing environments</b>                                    |             |  |              |
| <b><i>This program outcome has been met for me personally</i></b>   |             | <b><i>How meaningful do you consider this outcome to be for you personally?</i></b>    |              |
| A-5   agree strongly  | 4 (33.33%)  | A-5 Extremely meaningful   | 12 (100.00%) |
| B-4   agree moderately  | 5 (41.67%)  | B-4 Moderately meaningful  | 0 (0.00%)    |
| C-3   agree somewhat  | 2 (16.67%)  | C-3 Somewhat meaningful  | 0 (0.00%)    |
| D-2   disagree somewhat   | 0 (0.00%)   | D-2 Somewhat meaningless   | 0 (0.00%)    |
| E-1   disagree moderately   | 0 (0.00%)   | E-1 Moderately meaningless   | 0 (0.00%)    |
| F-0   disagree strongly   | 1 (8.33%)   | F-0 Extremely meaningless  | 0 (0.00%)    |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>  | <b>12</b>    |
| <b>Avg:</b>   | <b>3.83</b> | <b>Avg:</b>  | <b>5.00</b>  |
| <b>Std Dev:</b>   | <b>1.34</b> | <b>Std Dev:</b>  | <b>0.00</b>  |

**Outcome k: Students will be successful in applying for computer science related entry-level positions in business, industry or government**

|   |             |   |             |
|---|-------------|---|-------------|
| <b>Indicate your degree of success in finding CS related employment</b> |             | <b>My CS education is a meaningful contributor to my ability to find a suitable job</b> |             |
| A-5 Two or more good offers   | 1 (8.33%)   | A-5 Extremely meaningful  | 11 (91.67%) |
| B-4 One suitable offer  | 5 (41.67%)  | B-4 Moderately meaningful   | 1 (8.33%)   |
| C-3 Offer(s) not related to my major                                    | 0 (0.00%)   | C-3 Somewhat meaningful   | 0 (0.00%)   |
| D-2 I have applied, but no offers yet                                   | 2 (16.67%)  | D-2 Somewhat meaningless  | 0 (0.00%)   |
| E-1 All job applications have been rejected                             | 0 (0.00%)   | E-1 Moderately meaningless  | 0 (0.00%)   |
| F-0 I have not applied for employment                                   | 4 (33.33%)  | F-0 Extremely meaningless   | 0 (0.00%)   |
| <b>Total:</b>   | <b>12</b>   | <b>Total:</b>   | <b>12</b>   |
| <b>Avg:</b>   | <b>2.42</b> | <b>Avg:</b>   | <b>4.92</b> |
| <b>Std Dev:</b>   | <b>1.89</b> | <b>Std Dev:</b>   | <b>0.28</b> |

**Outcome l: Computer Science track graduates will be successful in gaining admission to graduate programs in Computer Science**

|  |             |   |             |
|--|-------------|---|-------------|
| <b>Indicate your degree of success in gaining admission to Graduate School</b> |             | <b>My CS education is a meaningful contributor to my ability to gain admission to graduate school</b> |             |
| A-5 Accepted at several schools  | 0 (0.00%)   | A-5 Extremely meaningful  | 10 (83.33%) |
| B-4 Accepted at a primary choice school  | 0 (0.00%)   | B-4 Moderately meaningful   | 2 (16.67%)  |
| C-3 Accepted at a secondary choice school                                      | 0 (0.00%)   | C-3 Somewhat meaningful   | 0 (0.00%)   |
| D-2 My applications are still pending  | 2 (16.67%)  | D-2 Somewhat meaningless  | 0 (0.00%)   |
| E-1 All my applications were rejected  | 0 (0.00%)   | E-1 Moderately meaningless  | 0 (0.00%)   |
| F-0 I have not applied to grad school  | 10 (83.33%) | F-0 Extremely meaningless   | 0 (0.00%)   |
| <b>Total:</b>  | <b>12</b>   | <b>Total:</b>   | <b>12</b>   |
| <b>Avg:</b>  | <b>0.33</b> | <b>Avg:</b>   | <b>4.83</b> |
| <b>Std Dev:</b>  | <b>0.75</b> | <b>Std Dev:</b>   | <b>0.37</b> |

| <b>* Overall Student Satisfaction for Computer Science Areas (Outcomes A-E)</b>      |             |
|--|-------------|
| A-5 Extremely meaningful   | 49 (81.67%) |
| B-4 Moderately meaningful  | 6 (10.00%)  |
| C-3 Somewhat meaningful  | 3 (5.00%)   |
| D-2 Somewhat meaningless   | 2 (3.33%)   |
| E-1 Moderately meaningless   | 0 (0.00%)   |
| F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>  | <b>60</b>   |
| <b>Avg:</b>  | <b>4.70</b> |
| <b>Std Dev:</b>  | <b>0.71</b> |
| <b>** Overall Student Satisfaction for Non-Computer Science Areas (Outcomes G-I)</b> |             |
| A-5 Extremely meaningful   | 16 (44.44%) |
| B-4 Moderately meaningful  | 11 (30.56%) |
| C-3 Somewhat meaningful  | 5 (13.89%)  |
| D-2 Somewhat meaningless   | 2 (5.56%)   |
| E-1 Moderately meaningless   | 2 (5.56%)   |
| F-0 Extremely meaningless  | 0 (0.00%)   |
| <b>Total:</b>  | <b>36</b>   |
| <b>Avg:</b>  | <b>4.03</b> |
| <b>Std Dev:</b>  | <b>1.14</b> |

## FIU - School of Computing and Information Sciences CS Alumni Survey

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First Survey: 02-11-2004 09:08:09 PM

Final Survey: 01-19-2008 05:54:13 AM

### Selected Archived

| General Information:   |              |  |             |
|--|--------------|--|-------------|
| <b>Did you graduate with a BS degree from FIU?</b>   |              |  |             |
| A-1 Yes  | 125 (96.90%) |  |             |
| B-0 No   | 4 (3.10%)    |  |             |
| <b>Total:</b>  | <b>129</b>   |  |             |
| <b>Avg:</b>  | <b>0.97</b>  |  |             |
| <b>Std Dev:</b>  | <b>0.17</b>  |  |             |
| <b>The following questions relate to our BS-CS program educational objectives.</b>                   |              |  |             |
| <b>For each of the following, please rate how your educational experience at FIU contributed to:</b> |              |  |             |
| <b>* Your capacity for personal growth</b>   |              | <b>* Your capacity for life-long learning</b>                |             |
| A-4 Excellent  | 61 (47.29%)  | A-4 Excellent  | 68 (52.71%) |
| B-3 Good   | 53 (41.09%)  | B-3 Good   | 51 (39.53%) |
| C-2 Satisfactory   | 15 (11.63%)  | C-2 Satisfactory   | 10 (7.75%)  |
| D-1 Poor   | 0 (0.00%)    | D-1 Poor   | 0 (0.00%)   |
| E-0 Unsatisfactory   | 0 (0.00%)    | E-0 Unsatisfactory   | 0 (0.00%)   |
| <b>Total:</b>  | <b>129</b>   | <b>Total:</b>  | <b>129</b>  |
| <b>Avg:</b>  | <b>3.36</b>  | <b>Avg:</b>  | <b>3.45</b> |
| <b>Std Dev:</b>  | <b>0.68</b>  | <b>Std Dev:</b>  | <b>0.63</b> |
| <b>* The development of your communication skills</b>  |              | <b>* Your awareness of social and ethical responsibility</b> |             |
| A-4 Excellent  | 33 (25.58%)  | A-4 Excellent  | 38 (29.46%) |
| B-3 Good   | 55 (42.64%)  | B-3 Good   | 54 (41.86%) |
| C-2 Satisfactory   | 38 (29.46%)  | C-2 Satisfactory   | 31 (24.03%) |
| D-1 Poor   | 3 (2.33%)    | D-1 Poor   | 6 (4.65%)   |
| E-0 Unsatisfactory   | 0 (0.00%)    | E-0 Unsatisfactory   | 0 (0.00%)   |
| <b>Total:</b>  | <b>129</b>   | <b>Total:</b>  | <b>129</b>  |
| <b>Avg:</b>  | <b>2.91</b>  | <b>Avg:</b>  | <b>2.96</b> |
| <b>Std Dev:</b>  | <b>0.80</b>  | <b>Std Dev:</b>  | <b>0.85</b> |
| <b>* Your preparation for a career in computer science</b>   |              | <b>* Your preparation for graduate study</b>                 |             |
| A-4 Excellent  | 50 (38.76%)  | A-4 Excellent  | 37 (28.68%) |
| B-3 Good   | 56 (43.41%)  | B-3 Good   | 66 (51.16%) |
| C-2 Satisfactory   | 20 (15.50%)  | C-2 Satisfactory   | 25 (19.38%) |
| D-1 Poor   | 2 (1.55%)    | D-1 Poor   | 1 (0.78%)   |
| E-0 Unsatisfactory   | 1 (0.78%)    | E-0 Unsatisfactory   | 0 (0.00%)   |
| <b>Total:</b>  | <b>129</b>   | <b>Total:</b>  | <b>129</b>  |
| <b>Avg:</b>  | <b>3.18</b>  | <b>Avg:</b>  | <b>3.08</b> |
| <b>Std Dev:</b>  | <b>0.80</b>  | <b>Std Dev:</b>  | <b>0.71</b> |

| <b>The following questions relate to the quality of our faculty and instruction</b>   |             |   |             |
|---|-------------|---|-------------|
| <b>** Please rate the expertise of our faculty in their subject areas</b>   |             | <b>** Please rate the dedication of our faculty to undergraduate teaching</b> |             |
| A-4 Excellent   | 63 (48.84%) | A-4 Excellent   | 48 (37.21%) |
| B-3 Good  | 57 (44.19%) | B-3 Good  | 63 (48.84%) |
| C-2 Satisfactory  | 6 (4.65%)   | C-2 Satisfactory  | 14 (10.85%) |
| D-1 Poor  | 2 (1.55%)   | D-1 Poor  | 1 (0.78%)   |
| E-0 Unsatisfactory  | 1 (0.78%)   | E-0 Unsatisfactory  | 3 (2.33%)   |
| <b>Total:</b>   | <b>129</b>  | <b>Total:</b>   | <b>129</b>  |
| <b>Avg:</b>   | <b>3.39</b> | <b>Avg:</b>   | <b>3.18</b> |
| <b>Std Dev:</b>   | <b>0.72</b> | <b>Std Dev:</b>   | <b>0.83</b> |
| <b>** Please rate the mentorship (guidance, counseling) provided by our faculty</b>   |             | <b>** Please rate the overall instructional capability of our faculty</b>     |             |
| A-4 Excellent   | 29 (22.48%) | A-4 Excellent   | 52 (40.31%) |
| B-3 Good  | 58 (44.96%) | B-3 Good  | 61 (47.29%) |
| C-2 Satisfactory  | 30 (23.26%) | C-2 Satisfactory  | 12 (9.30%)  |
| D-1 Poor  | 9 (6.98%)   | D-1 Poor  | 3 (2.33%)   |
| E-0 Unsatisfactory  | 3 (2.33%)   | E-0 Unsatisfactory  | 1 (0.78%)   |
| <b>Total:</b>   | <b>129</b>  | <b>Total:</b>   | <b>129</b>  |
| <b>Avg:</b>   | <b>2.78</b> | <b>Avg:</b>   | <b>3.24</b> |
| <b>Std Dev:</b>   | <b>0.95</b> | <b>Std Dev:</b>   | <b>0.78</b> |
| <b>The following questions are intended to help us determine how well the CS Curriculum prepares our students in specific areas of computer science</b> |             |   |             |
| <b>For each of the following, please rate the quality of your preparation upon graduation::</b>   |             |   |             |
| <b>*** Computer Programming</b>   |             | <b>*** Systems Development</b>  |             |
| A-4 Excellent   | 65 (50.39%) | A-4 Excellent   | 25 (19.38%) |
| B-3 Good  | 51 (39.53%) | B-3 Good  | 65 (50.39%) |
| C-2 Satisfactory  | 9 (6.98%)   | C-2 Satisfactory  | 31 (24.03%) |
| D-1 Poor  | 3 (2.33%)   | D-1 Poor  | 7 (5.43%)   |
| E-0 Unsatisfactory  | 1 (0.78%)   | E-0 Unsatisfactory  | 1 (0.78%)   |
| <b>Total:</b>   | <b>129</b>  | <b>Total:</b>   | <b>129</b>  |
| <b>Avg:</b>   | <b>3.36</b> | <b>Avg:</b>   | <b>2.82</b> |
| <b>Std Dev:</b>   | <b>0.78</b> | <b>Std Dev:</b>   | <b>0.83</b> |
| <b>*** Data Structures &amp; Algorithms</b>   |             | <b>*** Computer Architecture and Organization</b>                             |             |
| A-4 Excellent   | 57 (44.19%) | A-4 Excellent   | 34 (26.36%) |
| B-3 Good  | 56 (43.41%) | B-3 Good  | 62 (48.06%) |
| C-2 Satisfactory  | 12 (9.30%)  | C-2 Satisfactory  | 27 (20.93%) |
| D-1 Poor  | 4 (3.10%)   | D-1 Poor  | 4 (3.10%)   |
| E-0 Unsatisfactory  | 0 (0.00%)   | E-0 Unsatisfactory  | 2 (1.55%)   |
| <b>Total:</b>   | <b>129</b>  | <b>Total:</b>   | <b>129</b>  |
| <b>Avg:</b>   | <b>3.29</b> | <b>Avg:</b>   | <b>2.95</b> |
| <b>Std Dev:</b>   | <b>0.76</b> | <b>Std Dev:</b>   | <b>0.86</b> |

The following questions are intended to help us evaluate the extent to which SCS promotes diversity and an environment in which minority students can succeed.

|  |             |  |             |
|--|-------------|--|-------------|
| <p><b>**** Please rate our effectiveness in maintaining a diverse student population</b></p>       |             | <p><b>**** Please rate our diversity as an agent for your own personal growth</b></p>          |             |
| A-4 Excellent  | 70 (54.26%) | A-4 Excellent  | 42 (32.56%) |
| B-3 Good   | 44 (34.11%) | B-3 Good   | 59 (45.74%) |
| C-2 Satisfactory   | 14 (10.85%) | C-2 Satisfactory   | 24 (18.60%) |
| D-1 Poor   | 1 (0.78%)   | D-1 Poor   | 3 (2.33%)   |
| E-0 Unsatisfactory   | 0 (0.00%)   | E-0 Unsatisfactory   | 1 (0.78%)   |
| <b>Total:</b>  | <b>129</b>  | <b>Total:</b>  | <b>129</b>  |
| <b>Avg:</b>  | <b>3.42</b> | <b>Avg:</b>  | <b>3.07</b> |
| <b>Std Dev:</b>  | <b>0.71</b> | <b>Std Dev:</b>  | <b>0.82</b> |
| <p><b>**** Please rate our diversity as an agent for your own awareness of social concerns</b></p> |             | <p><b>**** Please rate the extent to which SCS promoted a healthy learning environment</b></p> |             |
| A-4 Excellent  | 30 (23.26%) | A-4 Excellent  | 53 (41.09%) |
| B-3 Good   | 67 (51.94%) | B-3 Good   | 63 (48.84%) |
| C-2 Satisfactory   | 29 (22.48%) | C-2 Satisfactory   | 9 (6.98%)   |
| D-1 Poor   | 2 (1.55%)   | D-1 Poor   | 3 (2.33%)   |
| E-0 Unsatisfactory   | 1 (0.78%)   | E-0 Unsatisfactory   | 1 (0.78%)   |
| <b>Total:</b>  | <b>129</b>  | <b>Total:</b>  | <b>129</b>  |
| <b>Avg:</b>  | <b>2.95</b> | <b>Avg:</b>  | <b>3.27</b> |
| <b>Std Dev:</b>  | <b>0.77</b> | <b>Std Dev:</b>  | <b>0.75</b> |

|   |               |
|---|---------------|
| <b>* Overall rating of educational experience at FIU</b>          |               |
| A-4 Excellent   | 287 (37.08%)  |
| B-3 Good  | 335 (43.28%)  |
| C-2 Satisfactory  | 139 (17.96%)  |
| D-1 Poor  | 12 (1.55%)    |
| E-0 Unsatisfactory  | 1 (0.13%)     |
| <b>Total:</b>   | <b>774</b>    |
| <b>Avg:</b>   | <b>3.16</b>   |
| <b>Std Dev:</b>   | <b>0.77</b>   |
| <b>** Overall quality of our faculty and instruction</b>          |               |
| A-4 Excellent   | 192 (37.21%)  |
| B-3 Good  | 239 (46.32%)  |
| C-2 Satisfactory  | 62 (12.02%)   |
| D-1 Poor  | 15 (2.91%)    |
| E-0 Unsatisfactory  | 8 (1.55%)     |
| <b>Total:</b>   | <b>516</b>    |
| <b>Avg:</b>   | <b>3.15</b>   |
| <b>Std Dev:</b>   | <b>0.85</b>   |
| <b>*** Overall rating of preparation upon graduation</b>          |               |
| A-4 Excellent   | 181 (35.08%)  |
| B-3 Good  | 234 (45.35%)  |
| C-2 Satisfactory  | 79 (15.31%)   |
| D-1 Poor  | 18 (3.49%)    |
| E-0 Unsatisfactory  | 4 (0.78%)     |
| <b>Total:</b>   | <b>516</b>    |
| <b>Avg:</b>   | <b>3.10</b>   |
| <b>Std Dev:</b>   | <b>0.84</b>   |
| <b>**** Overall rating of diversity promotion and environment</b> |               |
| A-4 Excellent   | 195 (37.79%)  |
| B-3 Good  | 233 (45.16%)  |
| C-2 Satisfactory  | 76 (14.73%)   |
| D-1 Poor  | 9 (1.74%)     |
| E-0 Unsatisfactory  | 3 (0.58%)     |
| <b>Total:</b>   | <b>516</b>    |
| <b>Avg:</b>   | <b>3.18</b>   |
| <b>Std Dev:</b>   | <b>0.78</b>   |
| <b>Overall satisfaction with BS-CS program objectives</b>         |               |
| A-4 Excellent   | 855 (36.82%)  |
| B-3 Good  | 1041 (44.83%) |
| C-2 Satisfactory  | 356 (15.33%)  |
| D-1 Poor  | 54 (2.33%)    |
| E-0 Unsatisfactory  | 16 (0.69%)    |
| <b>Total:</b>   | <b>2322</b>   |
| <b>Avg:</b>   | <b>3.15</b>   |
| <b>Std Dev:</b>   | <b>0.81</b>   |





## Assessment Report FIU Student Chapter, Association for Computing Machinery

Prepared by: Kip Irvine, ACM Faculty Advisor

Date: February 10, 2008

In general, the Fall 2007 semester was marked by a renewed interest in programming competitions. This was probably due to the extensive time and effort put into training a core group of competition team members between May and October 2007. The net result has been that we now have a core group of 8-10 leaders who have taken on an increasing amount of responsibility in running the organization. Secondly, supported by visits from software companies, the ACM club leadership has been actively campaigning for great awareness among students about applying for internships and joining departmental research groups. The establishment of a shared lounge area for student clubs in January 2008 has helped to improve the coordination among student leaders, and promises to be an effective aid to recruiting new student members.

### **ACM Southeast Regional Programming Competition**

The FIU ACM chapter sent two teams to the ACM programming competition, held in Melbourne, Florida in October 2007. Both teams ranked 36th overall, out of 58 teams. The teams were coached by Kip Irvine and Hien Nguyen, a professor at Miami-Dade College.

### **Fourth Annual High-School Programming Competition**

In April 2008, the ACM will host the Fifth Annual FIU High School Programming Competition. We anticipate that approximately ninety students from South Florida high schools will participate in the event. Microsoft is providing generous sponsorship.

### **Undergraduate Programming Competition**

In November 2007, the ACM club held an undergraduate programming competition for approximately 15 FIU students. First prize was awarded to George Sante. A second competition is scheduled for late February 2008.

### **Volunteer Tutoring Program**

The ACM club continued its volunteer tutoring program throughout 2007 and into 2008, with a roster of 10-12 tutors. Tutors were available for subjects such as Beginning and Intermediate Java, Data Structures, Unix, Computer Architecture, Software Engineering, and Visual Basic. One tutor, Drake Campbell, reported giving 20 hours of his time during the Fall semester.

### **Guest Lecture: Jose Alvarez**

Jose Alvarez, president of University Placement Services, gave a presentation for the ACM club about Entrepreneurship and the Web. Mr. Alvarez and his associates were the 2004 First Place winners in the FIU Venture Business challenge competition. Mr.

Alvarez, a dynamic speaker, gave many tips to students on how to start a Web-based business.

### **Ultimate Software**

A group of engineers from Ultimate Software, visited FIU in Fall 2007, and are scheduled again for Feb 12, 2008. Notable among the presenters were Greg Miller, of engineering recruiting, and Rafael Santos, VP of engineering. He and colleagues spoke about Agile Software development, Scrum, and automated Web testing systems. The lectures were very well attended, with standing room only. Approximately 15 FIU students have accepted internships and full-time positions at Ultimate Software within the past 2 years.

### **Student Picnic**

ACM and the **Women in Computer Science** club held a very successful picnic for FIU students in Crandon Park in November 2007. Approximately 40 students attended.

### **Robotics Special Interest Group**

In January 2008, a special interest group was created within ACM to focus on robotics. The group has attracted about 6 students, who will focus on both hardware construction and software to control the robots.

### **Graphics and Games Special Interest Group**

The ACM Graphics and Games group, which had been inactive in Fall 2007, has been revived in January 2008. The group meets weekly, along with the Robotics and Security groups.

### **ASP.NET Training Seminars**

The ACM club sponsored two hands-on ASP.NET training seminars for FIU students during November 2007.

### **Competition Problem Solving Workshops**

Through the summer and Fall Semester 2007, Kip Irvine and Hien Nguyen (MDC professor) continued the competition problem solving weekly workshop series. This group helps prepare undergraduate students for programming competitions. The group will be reactivated during April, to begin preparing for the Fall 2008 ACM Southeast Regional competition.

## Appendix G

### WICS@FIU REPORT for 2007

#### Spring 2007

- January 22, WICS representatives participated in SOC fair.
- February 9, CISCO's Yara Boullosa-We invited Yara Boullosa to discuss: CISCO as a company, opportunities at CISCO, her personal experience at CISCO, things she has learned as an engineer in a historically male dominated field.
- February 16, WICS visited Lotus House (Homeless Women) and made donations.
- March 9, Street Self Defense: Female students were asked to come in comfortable clothing, tennis shoes and be ready for an easy work out. Master Nolberto Parra and Master Carlos Sonzini from Black Belt Club USA came to FIU and gave a demonstration ideas and techniques for self-defense.
- March 20, WICS helped in the High School Programming Competition, organized by ACM.
- March 30, Wild Divine: Irene Polycarpou demonstrated the software, "The Journey to the Wild Divine", an alternative video game that teaches relaxation and body mind control.
- April 21, End of the year Party - WICS and ACM celebrated the end of the academic year. Officers tutors, and volunteers from both organizations received framed personalized Certificates of Appreciation.
- April 30, a representative from WICS participated in a SOC seminar learning about the new software which would be applied next year.

#### Fall 2007

- September 13, A meeting with Jenn Watt, Microsoft recruiter.
- September 17, WICS members participated in the Club Fair.
- October 12, Dr. Masoud Milani and Mr. Scott Graham presented the PIRE program to WICS members.
- October 12, Visit to the CATE Lab at the Engineering Campus.
- October 26, Mrs. Pat McDermott talked about her experience as a successful woman in the IT field.
- November 2, *Oral Presentation Skills Workshop*, presented by the FIU Oral Presentation Lab.
- November 3, WICS helped organize and run the SECME Bridge Building Seminar on the Engineering Campus.
- November 9, Visit to the Frost Museum at FIU campus.
- November 9, Meditation Event: Theory and Practice.
- November 16, Resume and Interview Tips Workshop, by Ashley Clayton, from Career Services.
- November 17, WICS, ACM & UPE Annual Picnic.

- November 27, A meeting with Dr. Camp, a successful woman in computer science.
  - Nov. 30, WICS hosted a Yoga class at the fitness center. The event was open to all FIU students.
  - December, WICS organized a Toy Drive for the Miami Rescue
- 
- Three WICS members participated in the 2007 Grace Hopper Celebration of Women in Computing Conference in Orlando.
  - During the two semesters, WICS provided free tutoring sessions.
  - As well as the above mentioned activities, WICS had meetings twice a month.
  - At least once a month, WICS' representative participated in a Leadership Seminar, organized by FIU Center for Leadership & Service.
  - Once a month, WICS' member, represented WICS at SOC meetings

## Appendix H:

### Summary of activities of the SCIS Industry Advisory Board

The Industry Advisory Board for the School held three meetings in calendar year 2007: May, September and December. At each of these meetings the Dean presents a report to the Board on school activities and progress. Board members discuss the Schools challenges and provide guidance and offer solutions on these issues. For more details please see: [www.cis.fiu.edu/iab](http://www.cis.fiu.edu/iab). Highlights of the member's activities with our school are listed below.

- The Board has successfully recruited seven new members from key CS/IT areas of the school including: Cleveland Clinic, Citrix, Miami Children's Hospital, Microsoft and other companies in the Venture Capital and Legal industry.
- Our partnership with IBM has grown significantly with IBM under the umbrella of our Latin American Grid (LA Grid) Program and with the guidance and active participation of the IBM Board member Pete Martinez. We have expanding the consortium of universities and companies to 12, the list you can find at [www.latinamericangrid.org](http://www.latinamericangrid.org). With the support of IBM and leverage from LA Grid, we won the NSF Partnership for International Research and Education award, a \$2.3M, 5-year award to conduct international research in the area of cyberinfrastructure application enablement ([www.pire.fiu.edu](http://www.pire.fiu.edu)). The consortium meet twice in 2007 for their collective Research Summit: In Spring at Tec Monterrey in Mexico and at IBM Research Watson in NY. Recent papers published in the area of grid computing technologies and their application in Bioinformatics and Disaster Mitigation were presented. IBM's commitment to support research activities of its staff is over \$5million in-kind support. IBM has continued its support of a LA Grid Scholars program which honors our top performing students with mentoring and internship opportunities.
- FIU's NSF Industry/University Collaborative Research Center, in the planning stage with collaborator Indiana University have worked closely in 2007. The Center coordinates technology research interests from a number of interested corporate partners including, EMC, IBM, Rhysome, Attenex, Muse Global, BioConvergence, Lilly, Qtrac and Sun Microsystems. The Center involves efforts in computer science (distributed systems, data bases, artificial intelligence, high performance computing and theory) and informatics (social informatics, bioinformatics, human computer interaction and design and complex network analysis).
- Board members will be assisting the School to develop a regional Business Continuity Information Network our School is leading. By participating in the network area companies will have access to the latest information from local governments on the status of public and private infrastructure, provide a means of locating resources in the local business sector, and coordinate their assessment of their facilities, supply chain and customers. Board members have assisted us in the development of a Center of Excellence Proposal to the State of Florida and have expressed interest in funding technology development.
- Board members are actively participating in our grant funding efforts by offering equipment donations, internships, and personnel assignment to assist with the

execution of our proposals. An example of such partnership is an NSF grant to conduct a workshop to provide software testing methodology education training with partnership from IBM and Ultimate Software to demonstrate industry application of testing techniques.

- Board members from IBM, Motorola Board, Siemens Networks, members gave lectures to our students, including additional lectures from Board member company's engineers.
- Many Board member companies conducted coordinated recruitment of our students into internships and full-time positions.

## Appendix I

### Subject Area Report for 2007

#### Subject Area: Communications & Ethics (Reported by Pat McDermott-Wells)

CGS 3092 Professional Ethics and Social Issues in Computer Science

COM 3011 Business and Professional Communication

ENC 3211 Report and Technical Writing

COM 3011 and ENC 3211 are taught by other instructional units and consequently are not subject to the School's assessment mechanisms. The Subject Area Coordinator's report thus addresses CGS 3092 only.

#### CGS 3092

*All objectives were covered on an assignment or in an in class discussion*

*All objective were considered essential*

*Most objectives were covered extensively except for team problem solving*

*Most prerequisite objectives were considered incidental*

*Recommendations: We should consider changing the prerequisite for this course to one semester of programming (COP 2210 or COP2250)*



## Appendix J

### Subject Area: Computer Systems (Reported by Masoud Sadjadi)

CDA 4101 Structured Computer Organization  
CNT 4513 (previously CEN 4500) Data Communications  
COP 3402 Fundamentals of Computer Systems  
COP 4225 Advanced UNIX Programming  
COP 4540 Database Management  
COP 4610 Operating Systems Principles  
COP 4226 Advanced Windows Programming  
COP 4991 Windows Component Technology  
CIS 4363 Computing and Network Security

#### CDA 4101 Structured Computer Organization

- *Appraisal and Course Evaluation Reports Status: This course was taught four times by the same instructor during the past year. The instructor has submitted the course appraisal for all the four sessions, but the first two appraisals are incomplete (the grid showing the coverage of outcomes with different tests, assignment, projects, etc. is missing). Also, the student evaluation for one of the sessions in fall 2007 is missing.*
- *Summary of Assessment: Four out of the five outcomes were indicated as essential by the instructor and they were all covered adequately in the two tests and one term project. However, the last outcome, indicated as inappropriate in spring 2007 and appropriate in fall 2007 by the same instructor, but it was either not covered at all or the coverage was not enough. In the course evaluation by the students, it is clear that the students expected more adequate coverage of the last outcome. Also, in one of the fall 2007 sessions, it is clear to see the students' unhappiness with the fact that there is no homework assignment in addition to the term project.*
- *Recommendation: I recommend no changes to the outcome of this course. Referring back to the reports of the past two years for this course, you can see that there are two minor issues with this course: first, students are not adequately exposed to the shared memory and MPI concepts at the end of the class as suggested; and second, there is no homework assignment, except for the term project. Unfortunately, the same exact problems have persisted for the last year sessions of this course. This means that either the recommendations have not been properly communicated to the instructor of this course or the instructor has neglected or failed to address the problems in his classes adequately. The good news is that the two issues mentioned are both minor issues that can be easily addressed in the future classes of this course.*

#### CNT 4513 (previously CEN 4500) Data Communications

- *Appraisal and Course Evaluation Reports Status: This course was taught four times by the two instructors during the past year. One of the course appraisals are missing (maybe due to the fact that the course number changed in the middle of the semester?). The student evaluations for all of the sessions are available.*
- *Summary of Assessment: The course has eight outcomes that have been all indicated as either essential or appropriate by the two instructors and have all*

*been covered either extensively or adequately by them through the assignments, tests, and term project. From the feedback in the students' evaluation, it seems that students have better received the required textbook by the second instructor, which is Computer Networking, A Top-Down Approach, 4th Edition, by James Kurose and Keith Ross, Addison Wesley (ISBN: 0321497708). The first instructor used the following book that was not received as well as the other one by the students: Computer Networks, 4th Edition, by Andrew S. Tanenbaum, Prentice Hall (ISBN: 0130661023).*

- *Recommendation: I recommend no changes to the outcome of this course. I recommend the following textbook to be used for this course: Computer Networking, A Top-Down Approach, 4th Edition, by James Kurose and Keith Ross, Addison Wesley (ISBN: 0321497708).*

#### COP 3402 Fundamentals of Computer Systems

- *Appraisal and Course Evaluation Reports Status: This course was taught five times by the same instructor during the past year. The instructor has submitted three course appraisals, one per semester, which basically covers all the five sessions. The student evaluations for all of the sessions are available in the system.*
- *Summary of Assessment: This course has five outcomes that have been indicated as either appropriate or essential by the instructor and according to him the outcomes have been adequately covered in the class. The students' evaluations in the two sessions of spring 2007, however, indicate inadequacy of the coverage of some of the outcomes.*
- *Recommendation: I recommend no changes to the outcome of this course. Also, the assignments by the instructor seem adequate.*

#### COP 4225 Advanced UNIX Programming

- *Appraisal and Course Evaluation Reports Status: This course was taught four times by two instructors during the past year. The instructor has submitted the course appraisal for all the four sessions, but the first appraisal is incomplete (the grid showing the coverage of outcomes with different tests, assignment, projects, etc. is missing). The student evaluation for all of the four sessions is available in the system.*
- *Summary of Assessment: This course has six outcomes, all indicated by the two instructors as either appropriate or essential. However, the last two outcomes, namely, "C-Shell, AWK, and Perl Programming" and "Interprocess Communication", have not been covered by one of the instructors sufficiently.*
- *Recommendation: I recommend no changes to the outcome of this course. To better cover the last two outcomes, I suggest extending the term project to include some shell and network programming.*

#### COP 4540 Database Management

- *Appraisal and Course Evaluation Reports Status: This course was taught four times by four instructors during the past year. One instructor has failed to submit his course appraisal. The student evaluation for all of the four sessions is available in the system.*

- *Summary of Assessment: This course has seven outcomes, all of which has been indicated by the instructors as either essential or appropriate. One of the outcomes, namely, “Be familiar with writing application programs that use SQL”, by one of the instructors was not covered adequately according to the student evaluations. The instructor has not submitted his course appraisal to better understand the reason for this shortcoming.*
- *Recommendation: I recommend no changes to the outcome of this course.*

#### COP 4610 Operating Systems Principles

- *Appraisal and Course Evaluation Reports Status: This course was taught three times by two instructors during the past year. The instructors have submitted all of the course appraisals for all the sessions. Also, the student evaluation for all of the sessions is available in the system.*
- *Summary of Assessment: This course has five outcomes, four of which have been indicated as appropriate or essential by the two instructors. However, the fourth outcome, namely, “Disc Allocation and Arm Scheduling”, seems as a good topic for an Advanced Storage Systems course, not for an undergraduate Operating System Principles course.*
- *Recommendation: I recommend removing the fourth outcome of this course, namely, “Disc Allocation and Arm Scheduling”. Also, the other outcomes should be revisited to include the following topics: Processes and Threads, Deadlocks, Memory Management, Input/Output, and File Systems.*

#### COP 4226 Advanced Windows Programming

- *Appraisal and Course Evaluation Reports Status: This course was taught once by one instructor during the past year. The instructor has submitted the course appraisal and the student evaluation is available in the system.*
- *Summary of Assessment: This course has seven outcomes, all of which have been indicated as appropriate or essential by the instructor.*
- *Recommendation: I recommend no changes to the outcome of this course.*

#### COP 4991 Windows Component Technology

- This course was not taught during the past year.

#### CIS 4363 Computing and Network Security

- This course was not taught during the past year.

## **Assessment of 2007 Foundations Courses**

Geoffrey Smith  
February 12, 2008

### **1 Introduction**

The Foundations courses are COT 3420 (Logic for Computer Science), COP 4555 (Principles of Programming Languages), MAD 2104 (Discrete Mathematics), MAD 3512 (Theory of Algorithms), and the math electives. Because the Mathematics Department has not done assessments for their courses, we address only COT 3420 and COP 4555.

The number of student assessments of COT 3420 and COP 4555 was again very low this year: 14 student assessments in six sections of COT 3420, and 17 student assessments in three sections of COP 4555 (one of which was in Jamaica), suggesting a response rate in the range of 10% to 25%, and data that may not be representative.

### **2 COT 3420 Logic for Computer Science**

In 2007, Alex Pelin taught four sections of COT 3420 and Ana Pasztor taught two. In their assessments, both express dissatisfaction with students' mathematical preparation, noting that students are weak at abstract thinking and proofs. Alex suggests that a large pool of tutors might help. Ana proposes that we create a new class specifically on induction and recursion, because these are foundational topics in computer science.

In the few student assessments submitted, around 70% agree (strongly or moderately) that the course outcomes are valuable and covered adequately; a number of students do seem to feel that more time should be spent on specifying problems in first-order logic and on Prolog. There were a number of thoughtful student comments. One student suggests that MAD 2104 should emphasize proof by induction to better prepare students for COT 3420. Another would prefer that more emphasis be given to applications, to better motivate the theory.

### **3 COP 4555 Principles of Programming Languages**

In 2007, Geoff Smith taught two sections of COP 4555 and Peter Clarke taught one, which was in Jamaica. In his appraisals, Geoff is satisfied with the students, but does note problems with attendance and tardiness. Regarding the long-standing question of a suitable textbook, Geoff is hopeful that the improved notes on his Moodle web site are now sufficient. In his appraisal of the Jamaica class, Peter suggests that COT 3420 should be a prerequisite, and notes that the compressed weekend format does not give students enough time to master the course material.

In the few student assessments submitted, around 90% agree (strongly or moderately) that the course outcomes are valuable and covered adequately. Only 65% of the students agree (strongly or moderately) that the textbook is adequate, however, suggesting that more improvement is needed in the on-line notes. In their comments, several students say

that they like the Moodle site and its on-line resources, and several students make a number of thoughtful suggestions for improving the notes; Geoff should follow them.

#### **4 Recommendations**

The three courses MAD 2104, COT 3420, and COP 4555 all deal heavily with induction and recursion. It would seem beneficial to make an effort to coordinate these three classes so that they better support one another. MAD 2104 is taken first, and I would suggest that it should aim not for broad (and therefore shallow) coverage of many topics, but rather should aim to develop *mathematical maturity* by emphasizing formal definitions, abstract reasoning, and proofs. The relationship between COT 3420 and COP 4555 should be considered carefully. COP 4555 teaches programming with recursion through a “Checklist” which is really an informal proof by induction that the program is correct. It might be that the Checklist gives concrete intuitions about induction that would help in understanding the more formal treatment of structural induction given in COT 3420. So perhaps COP 4555 should be taken before COT 3420. On the other hand, Peter suggests that COT 3420 should be a prerequisite for COP 4555. I think it would be valuable for the teachers of these courses to discuss how these courses fit together in the curriculum, and to establish a preferred course sequence.

## Appendix L

**FROM: Bill Kraynek**

**SUBJECT: Programming Coordinator Report for 2007**

This is my coordinator report of my assessment of our Programming Area. This area contains COP 2210, COP 3337, COP 3530 and COP 4338. To prepare this report I have used the student course assessments and instructor's course assessments for Fall 2007. The data included surveys for COP 2210, COP 3337, COP 3530 and COP 4338.

### **Student Course Assessments:**

#### **COP 2210:**

- 86% of students strongly or moderately agreed that the course outcomes were valuable
- 79% of students strongly or moderately agreed that the coverage was adequate
- 51% of the students strongly or moderately agreed that the required text was suitable

#### Recommendation:

Once again the textbook should be looked at since only half of the students thought it was suitable

#### **COP 3337:**

- 88% of students strongly or moderately agreed that the course outcomes were valuable
- 85% of students strongly or moderately agreed that the coverage was adequate
- 90% of the students strongly or moderately agreed that the required text was suitable. This is the same text that is used in COP 2210.
- A student comment said "...there are tutors in the Undergraduate computer lab that can help you with your programs". Tutors should not be helping students with their programs.

#### **COP 3530:**

- 93% of students strongly or moderately agreed that the course outcomes were valuable
- 72% of students strongly or moderately agreed that the coverage was adequate

#### **COP 4338:**

- 94% of students strongly or moderately agreed that the course outcomes were valuable
- 90% of students strongly or moderately agreed that the coverage was adequate

## **Instructor's Course Assessments:**

### **COP 2210**

- All objectives are covered on an assignment and/or an exam.
- All objectives are considered essential or appropriate.
- All objectives were covered extensively or adequately.
- All of the instructors thought that the student's preparation for taking the course was adequate.
- An instructor thinks that college algebra should be a prerequisite
- An instructor thinks that documentation standards should be one of the objectives

#### Recommendation:

- Since this course is primarily for computer science majors we should require a passing grade in college algebra.

### **COP 3337**

- All objectives are covered on an assignment and/or an exam..
- All objectives are considered essential or appropriate.
- All objectives were covered extensively or adequately except one instructor was not able to cover the Java Collections Interface enough
- All prerequisite objectives were useful or highly useful.
- One instructor thought that the students in his section had prerequisite deficiencies in Programming I especially Strings & ArrayLists..

#### Recommendation:

- Programming I instructors should be strongly encouraged to cover all of the objectives for Programming I especially Strings and ArrayLists.

### **COP 3530**

- Nothing was reported by instructors for COP 3530

### **COP 4338**

- All objectives were covered on an assignment and/or an exam
- All objective were considered essential
- All objectives were covered extensively
- The relevance prerequisite objectives was rated highly useful
- The mastery of prerequisite objectives was rated good
- The preparation of the students was rated good

### **Software Engineering Area Report – Calendar Year 2007**

This report contains the assessment of the courses in the Software Engineering Area taught in the School of Computing and Information Sciences for the calendar year 2007. This area contains the courses: CEN 4010 Software Engineering I, CEN 4015 Software Design and Development Project, and CEN 4021 Software Engineering II. The sections of CEN 4010 offered in the calendar year 2007 are as follows: two sections in the Spring, two sections in the Summer (FIU and Jamaica), and two sections in the Fall. One section of CEN 4015 in the Spring of 2007. No sections of CEN 4021 were offered during 2006, the class was cross-reference with the CEN5064 Software Design in Spring 2007. This report was prepared using the student and instructor's course assessments for the Spring, Summer and Fall semesters of 2007, available on the SCS website.

#### **Course outcomes:**

CEN 4010:

- (1) Be familiar with the Software Development Life Cycle
- (2) Master the techniques to gather and specify the requirements of a medium-size software system using UML,
- (3) Master the techniques to design and implement a medium-size software system
- (4) Be familiar with software testing techniques
- (5) Be familiar with software documentation
- (6) Be familiar with working in a small software development team
- (7) Be familiar with system walkthroughs

CEN 4015:

- (1) Demonstrate mastery of techniques of analyzing and designing software systems.
- (2) Demonstrate mastery of software planning.
- (3) Demonstrate mastery of software systems implementation.
- (4) Demonstrate mastery of software testing techniques.
- (5) Demonstrate ability to work effectively in a software development team.

#### **Student Course Assessments:**

The summary for the software engineering courses for calendar year 2007 includes the results of the survey on course delivery, course outcomes and student suggestions. The course delivery criteria included (1) the student's preparation for taking the course, (2) the level of difficulty of the course, (3) an evaluation of the required text, and (4) the amount of home work required for the course. The course outcomes are listed in the previous section.

#### **CEN 4010:**

A total of 21 students completed the online course evaluations for the 6 sections of CEN 4010 taught in 2007. The majority of the students surveyed (90%) either strongly agreed (76%) or moderately agreed (14%) that the course delivery was good. A majority of the students strongly or moderately agreed that the level of difficulty was adequate (94%). The suitability of the required text scored lowest in the course delivery criteria with a mean score of 3.95 out of a possible 5.



The results obtained for the course outcomes showed a similar trend. Over 85% of the students strongly agreed or moderately agreed that each course outcomes was valuable. For each of the course outcomes over 80% of the students strongly agreed or moderately agreed that each the course outcome was adequately covered in class. For the overall value of the course outcomes 79% of the students strongly agreed and 15% moderately agreed. For the overall adequacy of coverage of the course outcomes 70% strongly agreed and 22% moderately agreed.

**CEN 4015:**

One student took the course and completed the online survey for the course. The online survey seemed not to be meaningful since the student moderately agreed with every question on the survey, also the sample may have been too small to be statistically significant.

**Suggestions (Students):**

CEN 4010:

- The student suggestions were generally positive with respect to the course instructors.
- Professor Sanchez was given kudos for the job he did in the course.
- Two out of the eight comments stated that programming courses earlier in the curriculum should include some program design, design patterns and development.
- One student from Computer Engineering stated that s/he was ill-prepared for the course.

CEN 4015:

- None.

CEN 4021 (cross listed with CEN 5064 Software Design)

- Course required too much time outside of class.

**Instructor Course Assessments:**

**CEN 4010:**

The instructors for the sections taught in the Spring, Summer, and Fall semesters reported that the course objectives were covered using a variety of evaluation methods including tests, assignments, and project presentations and project deliverables. All the course objectives were either extensively or adequately covered for the Spring, Summer and Fall semesters. The mastery of prerequisite topics in all the semesters was either good or adequate. There was some concern that the topics of software testing and software documentation were inappropriate for the course and hence not adequately covered. There was only one tool reported to have been used to evaluate the students in both sections for Spring CEN 4010 - the course project.

**CEN 4015:**

The instructors reported that the course objectives were covered using project deliverables and project presentations. All the course objectives were either extensively or adequately covered. The prerequisite topics were all relevant and the students displayed either good or adequate mastery of these topics.

**Prerequisite Mastery (Instructors)**

CEN 4010:

- Deficient in COP 3530 Data Structures.

**Prerequisite Outcome Suggestions (Instructors):**

CEN 4010:

- Most projects involve a database. Few students indicated they had experience in the design and implementation of databases or in the ability to programmatically connect to a database. While not critical, since most figured it out, it would be helpful.
- Jamaica section – the Friday/Sunday 5 weekend period was too short for the students to gain the full benefit of the course project.
- In the Spring it appeared that the only form of evaluation used was the project, which covered all the outcomes. There were no exams.
- The instructors for the Spring course (both sections) stated that although programming is highly useful for the course the students were deficient in their programming skills. In addition the instructors stated that the relevance of data structure was incidental to the course and the students' knowledge was non-existent.
- The instructors for the Spring stated that use of UML and systems walkthroughs were inappropriate for the course. Systems walkthroughs were not covered in the course.

CEN 4015:

- The class had one student so it was difficult to identify any improvements that can be made.

### **General Comments (Instructors):**

CEN4010:

- This is an excellent course - and perhaps should be a two part course - part one - requirements analysis, specification, design and implementation - part two life cycle analysis, maintenance and testing and more. Testing topics, while covered, get the time crunch at the end of class.

CEN 4015:

- The number of student enrolled for the class continues to be small. There was one student in the Spring 2007 class.

### **Recommendations:**

- There is a need to resolve the issue of cross listing of CEN 4021 with CEN 5064 a graduate course. Some undergraduate students are finding it difficult.
- There is a need to have students take a programming course that contains web-based programming and working with databases before taking CEN 4010.
- There is a need for more students to take part in the online surveys.
- There should be a meeting with new adjunct professors and the course area coordinator at the beginning of the semester to discuss the course outcomes and objectives.

Peter J. Clarke  
Software Engineering Area Coordinator