SCHOOL OF COMPUTING & INFORMATION SCIENCES

Annual Assessment Summary 2006-2007
for
Bachelor of Science in Computer Science

Prepared by
Norman Pestaina – Assessments Coordinator

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 2006.

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 form the School's constituent groups.

The Survey instruments are summarized in the following table:

Instrument	**Target**	**Frequency**
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 responses to the Student Course Outcomes Survey for the period under review, 2006.

Course Number	Mean Value of Outcomes	Mean Adequacy of Coverage
CDA 4101	4.49	4.35
CEN 4010	4.61	4.25
CEN 4500	4.57	4.31
CGS 3092	4.49	4.43
COP 2210	4.43	4.22
COP 3337	4.44	4.34
COP 3402	4.55	4.63
COP 3530	4.32	4.28
COP 4225	4.44	4.39
COP 4226	4.70	4.50
COP 4338	4.19	3.38
COP 4540	4.39	3.75
COP 4555	4.38	4.49
COP 4610	4.47	3.85
COT 3420	4.33	4.12
ALL	4.45	4.22

Table 1: 2006 Value of Outcomes & Adequacy of Coverage

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 a large majority of classes.

Only one course COP 4338 falls below the 75% threshold in student perception of adequacy of coverage. We include here the student comments on this course as reported by the Subject Area Coordinator.

- *only 70% of the students strongly or moderately agreed that multithreading was a valuable outcome*
- *only 62% of students strongly or moderately agreed that multithreading was covered adequately*
- *only 72% of students strongly or moderately agreed that C++ was covered adequately*

(Subject Area Coordinator) Recommendations:

The importance of multithreading should be conveyed to the students along with more coverage

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

Year	Mean Value of Outcomes	Mean Adequacy of Coverage
2006	4.45	4.22
2005	4.45	4.22
2004	4.44	4.28

Table 2: Comparison of Annual Outcomes Ratings, 2004 – 2006

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 each section of a required or elective CS course. 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. Extracts from the Area Coordinators' reports that address the Instructor Course Outcomes Surveys are presented in this section. In some instances, it is 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 Bill Kraynek)
CGS 3092 Professional Ethics and Social Issues in Computer Science
COM 3011 Business and Professional Communication
ENC 3211 Report and Tehcnical 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
All prerequisite objectives were considered irrelevant
Recommendations: We should consider dropping the prerequisites for this course

Subject Area: Computer Systems (Reported by Prabu)
CDA 4101 Structured Computer Organization
CIS 4363 Computing and Network Security
CEN 4500 Data Communications
COP 3402 Fundamentals of Computer Systems
COP 4225 Advanced UNIX Programming
COP 4226 Advanced Windows Programming
COP 4540 Database Management
COP 4610 Operating Systems Principles
COP 4xxx Windows Component Technology

CDA 4101 Structured Computer Organization
For the seven outcomes of the course, most of the evaluations (more than 65%) agree either strongly or moderately. Few students expressed the need for additional home work or projects, and intermediate feedback on the final project or several smaller projects. Instructor course appraisals were given only for the Fall term.
Recommendation: No change in the course objectives. In addition to a big project, at least two small assignments need to be given to motivate students. In the first half of the course, a digital circuit simulator (Java applet - http://www.csee.umbc.edu/~chang/cs313.s02/digsim-info.shtml) can be used as a tool for small assignments.

CEN 4500 Data Communications

For each objective of the course, most of the evaluations (more than 65%) agree either strongly or moderately.
Recommendation: No change is needed on course objectives or textbook.

COP 3402 Fundamentals of Computer Systems
For each objective of the course, most of the evaluations (more than 75%) agree either strongly or moderately.
Recommendation: No change is needed on course objectives or syllabus.

COP 4225 Advanced UNIX Programming
For each objective of the course, most of the evaluations (more than 75%) agree either strongly or moderately.
Recommendation: No change is required on course objectives.

COP 4540 Database Management
For each objective of the course, most of the evaluations (more than 80%) agree either strongly or moderately.
Recommendation: No change is needed on textbook or syllabus.

COP 4610 Operating Systems Principles
For each objective of the course, most of the evaluations (more than 65%) agree either strongly or moderately.
Recommendation: No change is needed on course objectives or textbook. Resources for C/C++ language (e.g. sample programs, online references) need to be provided at the beginning of the term to facilitate students to prepare ahead for software projects 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.

COT 3420 Logic for Computer Science
<Instructor> taught one section in Spring and one in Summer A. <Instructor> taught one section in Spring and two in Fall. In their appraisals, both <Instructor> and <Instructor> note that students' preparation in induction and recursion is lacking. In one section, <Instructor> spent extra time reviewing this topic, but this left less time for first-order semantics and model theory; <Instructor> suggested that a new class on

induction and recursion would be helpful. <Instructor> also felt that the longer lectures in the Summer A section were beneficial, because less time was lost in reviewing where the previous lecture had left off. <Instructor> was strongly critical of students' preparation and level of effort; <Instructor> suggested that MAD 2104 should stress set theory and proofs and that COP 3337 should stress recursion to better prepare students for COT 3420.

It occurs to me that COP 4555 might help students to be prepared for COT 3420, because COP 4555 is heavily focused on programming with recursion. It would be interesting to see whether students who have completed COP 4555 prior to taking COT 3420 do better than those who have not; if so, perhaps it would be beneficial to encourage students to take the courses in that sequence.

COP 4555 Principles of Programming Languages
<Instructor> taught two sections in Spring and one in Fall. In his appraisals, he found students' preparation adequate, but expressed concern about poor class attendance. He also noted several academic integrity problems in his Fall class: one student used RentACoder to do programming assignments and several submitted work that was plagiarized from the web. He wondered whether the Ethics class discusses academic integrity; if not, perhaps that topic could be added. Finally, <Instructor> noted that rather than following a textbook, he presented notes and other resources on a Moodle web site. There would be advantages to a textbook, of course, but none really covers the set of topics that <Instructor>wants.

The student surveys indicate satisfaction with the course outcomes and the adequacy of the coverage. But it seems that many students would have preferred to follow a standard textbook, rather than using on-line materials.

<u>Subject Area: Programming (Reported by Bill Kraynek)</u>
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 thought that more TA help sessions would be useful
<u>Recommendations</u>:
Since this course is primarily for computer science majors we should require college algebra

COP 3337 Computer Programming 2

All objectives are covered on an assignment and/or an exam, although once again one instructor did not give an assignment requiring recursion.
All objectives are considered essential
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 Objects & Classes, Selection & Iteration and Strings & ArrayLists.

COP 3530 Data Structures

All objectives are covered on an assignment and/or an exam.
All objectives are considered essential or appropriate
One instructor was not able to cover advanced data structures and graph algorithms adequately
One instructor thought that prerequisite preparation in linked list data structures and Stack & Queue implementations are incidental to the course since presumably those topics are covered extensively in the course
One instructor rated the mastery of most of the prerequisite objectives as only adequate
One instructor rated the mastery of most of the prerequisite objectives as deficient
Recommendations:
The inclusion of linked lists and Stack & Queue implementation in COP 3337 should be reconsidered since those topics are covered in COP 3530 extensively.

COP 4338 Computer Programming 3

All objectives were covered on an assignment and/or an exam
All objective were considered essential or adequate
All objectives were covered extensively except that one instructor was not able to cover reflection enough
The relevance prerequisite objectives was rated highly useful or useful by all instructors
The mastery of prerequisite objectives was rated good by all instructors

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.
Prerequisite Mastery:
Deficient in COP 3530 Data Structures.

Prerequisite Outcome Suggestions (Instructors):

1: Students should take an additional programming course to expose them to windows-based programming and server-based programming. Most of the projects done used server-based programming.

2: A systems analysis and design course devoid of lingo.

General Comments (Instructors):

1: Some students are very weak in programming, resulting in a poor performance when coding the design of their project.

2: There are still several problems related to the projects, including team members not completing there assigned task.

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.

Prerequisite Outcome Suggestions (Instructors):

Need to have a strong CEN 4010 background, including mastery of documenting requirements and creating design artifacts.

General Comments (Instructors):

The number of student enrolled for the class continues to be small. There were 4 students in the Spring 2006 class.

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*

5: I agree strongly	*2: I disagree somewhat*
4: I agree moderately	*1: I disagree moderately*
3: I agree somewhat	*0: I disagree strongly*

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

5: Extremely meaningful	*2: Somewhat meaningless*
4: Moderately meaningful	*1: Moderately meaningless*
3: Somewhat meaningful	*0:Extremely meaningless*

The combined responses for spring and summer 2006 are shown in Appendix D and summarized in the following table. No data are available for the fall semester. The extremely low response rate to this survey merits immediate and vigorous remedy.

Summary of responses to the Graduating Student Survey Spring 06, Summer 06
9 Respondents

Program Outcomes		*Outcome Attainment*		*Perceived Relevance*	
		Average	*Percentage*	*Average*	*Percentage*
Proficiency in foundation areas		4.33	86.60	4.33	86.60
Proficiency in core areas		4.56	91.20	4.67	93.40
Proficiency in problem solving		4.33	86.60	4.78	95.60
Proficiency in a programming language		4.56	91.20	4.44	88.80
Understanding of social & ethical issues		4.00	80.00	4.00	80.00
Ability to work cooperatively		4.44	88.80	5.00	100.00
Effective communication skills		4.00	80.00	4.78	95.60
Understanding the scientific method		3.78	75.60	3.89	77.80
Familiarity with the arts, humanities, etc		3.78	75.60	3.00	60.00
Experience state of the art computing facilities		3.56	71.20	4.33	86.60
Success in applying for entry-level positions		3.22	64.40	4.44	88.80
(8 respondents)	*1	3.63	72.50		
Success in admission to graduate school		0.67	13.40	4.11	82.20
(2 respondents)	*2	3.00	60.00		
Overall CS student satisfaction		4.44	88.80		
Average including *1 and *2		4.03	80.62		

*1 Modified to reflect only those (8) respondents who actually applied for employment
*2 Modified to reflect only those (2) respondents who actually applied to grad school

Table 3: Attainment & Relevance of Program Outcomes

Program outcomes relating to Computer Science curriculum
(CS foundation areas, CS core areas, problem solving, programming languages)

As might be expected, graduating students perceive the importance of these outcomes to be very high (86.60%, 93.40%, 95.60%, 88.80%). Importantly, the students' attainment ratings for these areas generally match their expectations (96.60%, 91.20%, 86.60%, 91.20%). We conclude that these highly significant program outcomes are being met at appropriately high levels that far exceed the minimum acceptable 75% threshold..

Program outcomes relating to work environment skills
(Social & ethical issues, Ability to work cooperatively, 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 very high (80%, 100%, 95.6%), on levels comparable to the importance attached to technical preparedness (above). Our graduates report that these outcomes are being met at appropriately high levels (80%, 88.8%, 80%), well in excess of the minimum accepted threshold of 75%.

Program outcomes relating to non-computer science curriculum
(Understanding the scientific method, Familiarity with the arts & humanities)

Predictably, our graduating students attach somewhat lower importance (77.8%, 60%) to these outcomes. Nonetheless, they report acceptable levels of attainment of these outcomes (both 75.6%).

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

The survey results show that the attainment level on this outcome is significantly below its level of importance, 71.26% compared to 86.6%. Although the 71.26% attainment level represents some increase over the 68.6% level reported in last years' report, it is still slightly below our 75% threshold acceptance level, and some students believe that this is a highly important aspect of their education that is not fully meeting their expectations. It seems prudent to determine which aspects of our computing environments fall short of our students' expectations, particularly as our systems group would certainly find this lower attainment level surprising.

Outcome: Success in applying for entry-level positions
The aggregate method of reporting here does not yield a meaningful statistic as the score if significantly weighted (2 of 8) by responses of students who had not yet received job offers. Conceivably, these students would still have a reasonable expectation of finding suitable employment, particularly as the survey is conducted prior to the students' actual graduation. The raw scores (see Appendix D) do not warrant special attention.

Outcome: Success in admission to graduate school
The paucity of data, 2 responses, does not permit any meaningful interpretation. Of the 9 respondents, 1 had been accepted, 1 was awaiting the result of his/her application, and 7 had not applied to grad school. No inferences are available here.

Overall Student Satisfaction
The 88.8% attainment level for the CS-curriculum areas is a very positive indicator of the strength of our BS program. The outcomes aggregated in this statistic include the curriculum taught by CS faculty predominantly: foundation areas, core areas, problem solving, programming skills, social & ethical issues. It is easy to conclude that the CS curricular outcomes of the program continue to be met at very high levels. The curricular outcomes excluded from this group, scientific method and arts & humanities, relate to courses taught by other departments and at earlier stages of our students' college life. In any event, these aspects are not directly within the control of the SCIS. Some attention should be paid to the non-curricular outcomes relating to the computing environment, employability and entry to graduate programs.

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.

Summary of Alumni Survey of Program Objectives
Cumulative through 01/2007 — 124 Respondents

BS-CS	*Program Objective*	*Outcome Attainment*	
		Average	*Percentage*
1	Capacity for personal growth	3.35	83.75
1	Capacity for life-long learning	3.45	86.25
3	Development of communication skills	2.90	72.50
3	Awareness of social & ethical responsibility	2.94	73.50
4	Preparation for a career in computer science	3.19	79.75
4	Preparation for graduate study	3.09	77.25
6	Expertise of faculty in their subject areas	3.40	85.00
6	Dedication of faculty to teaching	3.18	79.50
6	Mentorship provided by the faculty	2.77	69.25
6	Overall Instructional capability of the faculty	3.25	81.25
2	Computer Programming	3.37	84.25
2	Systems Development	2.81	70.25
2	Data Structures & Algorithms	3.30	82.50
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	3.05	76.25
5	Diversity as an agent for social awareness	2.94	73.50
5	Maintaining a healthy learning environment	3.27	81.75
all	Overall FIU educational experience rating	3.15	78.75
6	Overall faculty & instruction rating	3.15	78.75
4	Overall preparation upon graduation	3.11	77.75
4	Overall rating of diversity and environment	3.17	79.25
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 2006. The table shows the weighted average 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 124 respondents represents an increase of only 7 over the count of 117 for the previous review period. Table 5 provides a quick comparison of the 2005 and 2006 "overall" ratings. As might be expected, the current response scores are virtually indistinguishable from those of the previous report.

Year	FIU Educational Experience	Faculty & Instruction	Preparation At Graduation	Diversity & Environment	Satisfaction With BS_CS
2005	78.75	79.00	77.50	79.25	78.75
2006	78.75	78.75	77.75	79.25	78.85

Table 5: Comparison of Overall Ratings, 2005 - 2006

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 reports another active year, again competing with good success in the ACM Southeast Regional programming competition by placing 7th overall among 65 teams. Locally, the Chapter's continued hosting of the Miami area high school programming competition has been rewarded with repeated sponsorship by IBM and new sponsorship by Adobe Corporation. The chapter is also to be commended for continuing to emphasize community involvement among its members via its tutoring programs and Xmas toy drive in conjunction with WICS. These accomplishments are in addition to the Chapter's traditional academic interest group activities.

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

B. Women In Computer Science Group

Perusal of he WICS group report reveals that the organization maintained a full and exciting calendar of events during 2006. Its several invited talks by well respected guests included many on "life experience" as well as on academic topics, and evidences the WICS organization's continued emphasis on fostering the personal well-being of its members. Their successful on-going involvement with the Coral Park Senior High School is commendable for the level of commitment which this successful project exacts from the WICS membership. This singular organization continues to be in the forefront of attracting women into the Computer Science discipline, and nurturing them.

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

C. Industry Advisory Board

The SCIS Industrial Advisory board continued to be an active and critical focal point of the School's operation, with meetings in May and December of 2006.

In recognition of our School's role as a major source for the IT workforce in South Florida, the SCIS-IAB initiated an Industry Scholarship Fund to enhance the School's recruitment and retention of high quality students for its CS and IT programs.

A summary of the activities of the Industrial Advisory Board during 2006 is included here as Appendix H.

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:	4.45 on a scale of 5, or 89.0%
Perceived adequacy of coverage:	4.22 on a scale of 5, or 84.4%

COP 4338: There is a concern about the content of the course that should be addressed.

COP 4555: There is a concern about the lack of a suitable textbook.

Course Outcomes Survey by Instructors

Communications & Ethics
CGS 3092: Reconsider the prerequisites

Computer Systems
CDA 4101: Consider adding small introductory projects
COP 4610: Suggestion to provide C/C++ resources early in the term

Foundations
COT 3420: Student prerequisite preparation continues to be a major concern
COP 4556: Concerns about students' attendance and ethics

Programming
COP 2210: Consider College Algebra as a prerequisite
COP 3337: Reconsider the inclusion of linked lists, stacks and queues

Software Engineering
CEN 4010: Several concerns about prerequisite preparation (please refer to section III b).

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 is a minor concern of a lower than anticipated score on the students' perception of the standard of the computing facilities.

There is a 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 reliability.

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 report. 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
	Objectives 1, 2, 3	Objective 6	Objectives 2, 3, 4	Objective 5	ALL Objectives
2005	78.75	79.00	77.50	79.25	78.75
2006	78.75	78.75	77.75	79.25	78.85

Table 6: Attainment of BS-CS Program Objectives

Additionally, the other interest groups within the SCIS umbrella 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 – 83.75%*
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 – 84.25%
   Systems Development – 70.25%
   Data Structures and Algorithms – 82.50%
   Computer Architecture and Organization – 73.75%

Conclusions
This objective is being met. However, the indicators for the Systems areas, while improved over last year's 67.68%, is yet below 75% and may still merit some attention.

Recommendations
- The Subject Area Coordinator for the Computer Systems area and/or the SCIS Undergraduate Committee should continue to monitor this very important area closely to determine if there is a need to provide additional coverage in this area, either by introducing a new course(s) or strengthening the content of existing courses. The Course Outcomes Survey by Students responses for "adequacy of coverage" in COP 4540 and COP 4610 just meet the acceptance level of 75%. These are both critical courses in the CS curriculum. Their study should take into account the recommendations made in last year's Assessment report, and any measures put into place since then.

- The computing facilities should be evaluated (see the discussion in the section on the Graduating Students Survey).

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* – 72.50%
2) *Awareness of social and ethical responsibility* – 73.50%

Conclusions
This objective is being met, but should be strengthened.

Recommendations
- The Subject Area Coordinator should have a closer look at the delivery of CGS 3092.

- The remarks of the Foundations area Coordinator should be considered in the broader scope of our entire curriculum (see Course Outcomes Survey by Instructor).

- Although the communication skills courses ENC 3211 and COM 3011 are taught by other departments, an assessment process should be instituted for these courses. It should be noted that our graduating students ascribe very high value, 95.6%, to this area of their training.

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

Indicators
1) *Preparation for a career in computer science* – 79.75%
2) *Preparation for graduate study* – 77.25%
3) *Initiatives of the Industry Advisory Board – Extremely significant*

Conclusions
The objective is being met. The scores reported here are identical to the scores reported in last year's report. The establishment of the Industry Scholarship Fund by the School's Industry Advisory Board is a strong indicator of the perceived value of our graduates in the region's workforce. The observations of the last report continue to be relevant.

Recommendations
None.

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 – 76.25%
3) Diversity as an agent for social awareness – 73.50%
4) Healthy learning environment – 81.75%
5) Overall rating of diversity and environment – 79.25%
6) Activities of the WICS & ACM groups - Outstanding

Conclusions
This objective is being met. The WICS group should be publicly commended for their outstanding contribution to our attainment in this area.

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* – 85.00%
2) *Dedication of faculty to teaching* – 79.50%
3) *Mentorship provided by the faculty* – 69.25%
4) *Overall instructional capability of the faculty* – 81.25%

Conclusions
This objective is being met.

Recommendations
The SCIS faculty should be encouraged to continue and to strengthen their mentorship roles.

V. CONCLUSIONS

This report has considered indicators from the alumni, students and faculty of our School. Other constituents including our student organizations and the Industry Advisory Board have provided very meaningful input to our 2006 assessment process.

The report presents recommendations for maintaining excellence in our undergraduate computer science program.

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 strong indications that the program outcomes at met at very high levels.

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 re-affirm the School's commitment to its mission.

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) O*ther 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:

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.

Appendix C:

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 D

FIU - School of Computing and Information Sciences

CS Exit Survey

Home Logout

First Survey: 05-05-2006 03:35:33 PM Final Survey: 10-12-2006 07:05:18 AM

Spring 2006 - Summer 2006

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

This program outcome has been met for me personally

A-5 I agree strongly	4 (44.44%)
B-4 I agree moderately	4 (44.44%)
C-3 I agree somewhat	1 (11.11%)
D-2 I disagree somewhat	0 (0.00%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.33**
Std Dev:	**0.67**

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

A-5 Extremely meaningful	5 (55.56%)
B-4 Moderately meaningful	2 (22.22%)
C-3 Somewhat meaningful	2 (22.22%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.33**
Std Dev:	**0.82**

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

This program outcome has been met for me personally

A-5 I agree strongly	7 (77.78%)
B-4 I agree moderately	1 (11.11%)
C-3 I agree somewhat	0 (0.00%)
D-2 I disagree somewhat	1 (11.11%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.56**
Std Dev:	**0.96**

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

A-5 Extremely meaningful	7 (77.78%)
B-4 Moderately meaningful	1 (11.11%)
C-3 Somewhat meaningful	1 (11.11%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.67**
Std Dev:	**0.67**

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

This program outcome has been met for me personally

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

A-5 I agree strongly	4 (44.44%)
B-4 I agree moderately	4 (44.44%)
C-3 I agree somewhat	1 (11.11%)
D-2 I disagree somewhat	0 (0.00%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.33**
Std Dev:	**0.67**

A-5 Extremely meaningful	8 (88.89%)
B-4 Moderately meaningful	0 (0.00%)
C-3 Somewhat meaningful	1 (11.11%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.78**
Std Dev:	**0.63**

Outcome d: Students will demonstrate mastery of at least one modern programming language and proficiency in at least one other

This program outcome has been met for me personally

A-5 I agree strongly	7 (77.78%)
B-4 I agree moderately	1 (11.11%)
C-3 I agree somewhat	0 (0.00%)
D-2 I disagree somewhat	1 (11.11%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.56**
Std Dev:	**0.96**

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

A-5 Extremely meaningful	6 (66.67%)
B-4 Moderately meaningful	2 (22.22%)
C-3 Somewhat meaningful	0 (0.00%)
D-2 Somewhat meaningless	1 (11.11%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.44**
Std Dev:	**0.96**

Outcome e: Students will demonstrate understanding of the social and ethical concerns of the practicing computer scientist

This program outcome has been met for me personally

A-5 I agree strongly	4 (44.44%)
B-4 I agree moderately	3 (33.33%)
C-3 I agree somewhat	0 (0.00%)
D-2 I disagree somewhat	2 (22.22%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.00**
Std Dev:	**1.15**

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

A-5 Extremely meaningful	3 (33.33%)
B-4 Moderately meaningful	3 (33.33%)
C-3 Somewhat meaningful	3 (33.33%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.00**
Std Dev:	**0.82**

Outcome f: Students will demonstrate the ability to work cooperatively in teams

This program outcome has been met for me personally

A-5 I agree strongly	6 (66.67%)
B-4 I agree moderately	2 (22.22%)
C-3 I agree somewhat	0 (0.00%)
D-2 I disagree somewhat	1 (11.11%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.44**
Std Dev:	**0.96**

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

A-5 Extremely meaningful	9 (100.00%)
B-4 Moderately meaningful	0 (0.00%)
C-3 Somewhat meaningful	0 (0.00%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**5.00**
Std Dev:	**0.00**

Outcome g: Students will demonstrate effective communication skills

This program outcome has been met for me personally

A-5 I agree strongly	4 (44.44%)
B-4 I agree moderately	2 (22.22%)
C-3 I agree somewhat	2 (22.22%)
D-2 I disagree somewhat	1 (11.11%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**
Avg:	**4.00**
Std Dev:	**1.05**

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

A-5 Extremely meaningful	7 (77.78%)
B-4 Moderately meaningful	2 (22.22%)
C-3 Somewhat meaningful	0 (0.00%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.78**
Std Dev:	**0.42**

Outcome h: Students will demonstrate understanding of the scientific method

This program outcome has been met for me personally

A-5 I agree strongly	3 (33.33%)
B-4 I agree moderately	3 (33.33%)
C-3 I agree somewhat	1 (11.11%)
D-2 I disagree somewhat	2 (22.22%)
E-1 I disagree moderately	0 (0.00%)
F-0 I disagree strongly	0 (0.00%)
Total:	**9**

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

A-5 Extremely meaningful	2 (22.22%)
B-4 Moderately meaningful	4 (44.44%)
C-3 Somewhat meaningful	3 (33.33%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)

Avg:		**3.78**
Std Dev:		**1.13**

Total:		**9**
Avg:		**3.89**
Std Dev:		**0.74**

Outcome i: Students will demonstrate familiarity with fundamental ideas and issues in the arts, humanities and social sciences

This program outcome has been met for me personally

A-5 I agree strongly		4 (44.44%)
B-4 I agree moderately		2 (22.22%)
C-3 I agree somewhat		2 (22.22%)
D-2 I disagree somewhat		0 (0.00%)
E-1 I disagree moderately		0 (0.00%)
F-0 I disagree strongly		1 (11.11%)
Total:		**9**
Avg:		**3.78**
Std Dev:		**1.55**

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

A-5 Extremely meaningful		2 (22.22%)
B-4 Moderately meaningful		0 (0.00%)
C-3 Somewhat meaningful		5 (55.56%)
D-2 Somewhat meaningless		1 (11.11%)
E-1 Moderately meaningless		0 (0.00%)
F-0 Extremely meaningless		1 (11.11%)
Total:		**9**
Avg:		**3.00**
Std Dev:		**1.41**

Outcome j: Students will have experience working in state-of-the-art computing environments

This program outcome has been met for me personally

A-5 I agree strongly		3 (33.33%)
B-4 I agree moderately		2 (22.22%)
C-3 I agree somewhat		2 (22.22%)
D-2 I disagree somewhat		1 (11.11%)
E-1 I disagree moderately		1 (11.11%)
F-0 I disagree strongly		0 (0.00%)
Total:		**9**
Avg:		**3.56**
Std Dev:		**1.34**

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

A-5 Extremely meaningful		5 (55.56%)
B-4 Moderately meaningful		2 (22.22%)
C-3 Somewhat meaningful		2 (22.22%)
D-2 Somewhat meaningless		0 (0.00%)
E-1 Moderately meaningless		0 (0.00%)
F-0 Extremely meaningless		0 (0.00%)
Total:		**9**
Avg:		**4.33**
Std Dev:		**0.82**

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

Indicate your degree of success in finding CS related employment

A-5 Two or more good offers		3 (33.33%)
B-4 One suitable offer		1 (11.11%)
C-3 Offer(s) not related to my major		2 (22.22%)
D-2 I have applied, but no offers yet		2 (22.22%)
E-1 All job applications have		0 (0.00%)

My CS education is a meaningful contributor to my ability to find a suitable job

A-5 Extremely meaningful		5 (55.56%)
B-4 Moderately meaningful		3 (33.33%)
C-3 Somewhat meaningful		1 (11.11%)
D-2 Somewhat meaningless		0 (0.00%)
E-1 Moderately meaningless		0 (0.00%)

been rejected	
F-0 I have not applied for employment	1 (11.11%)
Total:	**9**
Avg:	**3.22**
Std Dev:	**1.62**

F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.44**
Std Dev:	**0.68**

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

Indicate your degree of success in gaining admission to Graduate School

A-5 Accepted at several schools	0 (0.00%)
B-4 Accepted at a primary choice school	1 (11.11%)
C-3 Accepted at a secondary choice school	0 (0.00%)
D-2 My applications are still pending	1 (11.11%)
E-1 All my applications were rejected	0 (0.00%)
F-0 I have not applied to grad school	7 (77.78%)
Total:	**9**
Avg:	**0.67**
Std Dev:	**1.33**

My CS education is a meaningful contributor to my ability to gain admission to graduate school

A-5 Extremely meaningful	3 (33.33%)
B-4 Moderately meaningful	4 (44.44%)
C-3 Somewhat meaningful	2 (22.22%)
D-2 Somewhat meaningless	0 (0.00%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**9**
Avg:	**4.11**
Std Dev:	**0.74**

**** Overall Student Satisfaction for Computer Science Areas (Outcomes A-E)***

A-5 Extremely meaningful	29 (64.44%)
B-4 Moderately meaningful	8 (17.78%)
C-3 Somewhat meaningful	7 (15.56%)
D-2 Somewhat meaningless	1 (2.22%)
E-1 Moderately meaningless	0 (0.00%)
F-0 Extremely meaningless	0 (0.00%)
Total:	**45**
Avg:	**4.44**
Std Dev:	**0.83**

***** Overall Student Satisfaction for Non-Computer Science Areas (Outcomes G-I)***

A-5 Extremely meaningful	11 (40.74%)
B-4 Moderately meaningful	6 (22.22%)

C-3 Somewhat meaningful		8 (29.63%)
D-2 Somewhat meaningless		1 (3.70%)
E-1 Moderately meaningless		0 (0.00%)
F-0 Extremely meaningless		1 (3.70%)
Total:		**27**
Avg:		**3.89**
Std Dev:		**1.20**

Appendix E

FIU - School of Computing and Information Sciences

CS Alumni Survey

Home Logout

First Survey: 02-11-2004 09:08:09 PM Final Survey: 01-04-2007 11:08:22 AM

Current Data + Fall 2003

General Information:

Did you graduate with a BS degree from FIU?

A-1 Yes		121 (97.58%)
B-0 No		3 (2.42%)
Total:		**124**
Avg:		**0.98**
Std Dev:		**0.15**

The following questions relate to our BS-CS program eduational objectives.

For each of the following, please rate how your educational experience at FIU contributed to:

**** Your capacity for personal growth***

A-4 Excellent		58 (46.77%)
B-3 Good		52 (41.94%)
C-2 Satisfactory		14 (11.29%)
D-1 Poor		0 (0.00%)
E-0 Unsatisfactory		0 (0.00%)
Total:		**124**
Avg:		**3.35**
Std Dev:		**0.67**

**** Your capacity for life-long learning***

A-4 Excellent		65 (52.42%)
B-3 Good		50 (40.32%)
C-2 Satisfactory		9 (7.26%)
D-1 Poor		0 (0.00%)
E-0 Unsatisfactory		0 (0.00%)
Total:		**124**
Avg:		**3.45**
Std Dev:		**0.63**

**** The development of your communication skills***

A-4 Excellent		31 (25.00%)
B-3 Good		53 (42.74%)
C-2 Satisfactory		37 (29.84%)
D-1 Poor		3 (2.42%)
E-0 Unsatisfactory		0 (0.00%)
Total:		**124**
Avg:		**2.90**
Std Dev:		**0.80**

**** Your awareness of social and ethical responsibility***

A-4 Excellent		35 (28.23%)
B-3 Good		53 (42.74%)
C-2 Satisfactory		30 (24.19%)
D-1 Poor		6 (4.84%)
E-0 Unsatisfactory		0 (0.00%)
Total:		**124**
Avg:		**2.94**
Std Dev:		**0.85**

**** Your preparation for a career in computer science***

A-4 Excellent		48 (38.71%)
B-3 Good		54 (43.55%)

**** Your preparation for graduate study***

A-4 Excellent		36 (29.03%)
B-3 Good		64 (51.61%)

C-2 Satisfactory	20 (16.13%)
D-1 Poor	1 (0.81%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.19**
Std Dev:	**0.79**

C-2 Satisfactory	23 (18.55%)
D-1 Poor	1 (0.81%)
E-0 Unsatisfactory	0 (0.00%)
Total:	**124**
Avg:	**3.09**
Std Dev:	**0.71**

The following questions relate to the quality of our faculty and instruction

***** Please rate the expertise of our faculty in their subject areas***

A-4 Excellent	61 (49.19%)
B-3 Good	55 (44.35%)
C-2 Satisfactory	6 (4.84%)
D-1 Poor	1 (0.81%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.40**
Std Dev:	**0.69**

***** Please rate the dedication of our faculty to undergraduate teaching***

A-4 Excellent	46 (37.10%)
B-3 Good	61 (49.19%)
C-2 Satisfactory	13 (10.48%)
D-1 Poor	1 (0.81%)
E-0 Unsatisfactory	3 (2.42%)
Total:	**124**
Avg:	**3.18**
Std Dev:	**0.83**

***** Please rate the mentorship (guidance, counseling) provided by our faculty***

A-4 Excellent	27 (21.77%)
B-3 Good	57 (45.97%)
C-2 Satisfactory	28 (22.58%)
D-1 Poor	9 (7.26%)
E-0 Unsatisfactory	3 (2.42%)
Total:	**124**
Avg:	**2.77**
Std Dev:	**0.95**

***** Please rate the overall instructional capability of our faculty***

A-4 Excellent	50 (40.32%)
B-3 Good	59 (47.58%)
C-2 Satisfactory	12 (9.68%)
D-1 Poor	2 (1.61%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.25**
Std Dev:	**0.76**

The following questions are intended to help us determine how well the CS Curriculum prepares our students in specific areas of computer science

For each of the following, please rate the quality of your preparation upon graduation::

****** Computer Programming***

A-4 Excellent	62 (50.00%)
B-3 Good	50 (40.32%)
C-2 Satisfactory	9 (7.26%)
D-1 Poor	2 (1.61%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.37**

****** Systems Development***

A-4 Excellent	23 (18.55%)
B-3 Good	63 (50.81%)
C-2 Satisfactory	31 (25.00%)
D-1 Poor	6 (4.84%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**2.81**

Std Dev:	**0.76**

Std Dev:	**0.82**

***** Data Structures & Algorithms***

A-4 Excellent	54 (43.55%)
B-3 Good	56 (45.16%)
C-2 Satisfactory	11 (8.87%)
D-1 Poor	3 (2.42%)
E-0 Unsatisfactory	0 (0.00%)
Total:	**124**
Avg:	**3.30**
Std Dev:	**0.73**

***** Computer Architecture and Organization***

A-4 Excellent	31 (25.00%)
B-3 Good	62 (50.00%)
C-2 Satisfactory	26 (20.97%)
D-1 Poor	4 (3.23%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**2.95**
Std Dev:	**0.81**

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.

***** Please rate our effectiveness in maintaining a diverse student population***

A-4 Excellent	67 (54.03%)
B-3 Good	43 (34.68%)
C-2 Satisfactory	13 (10.48%)
D-1 Poor	1 (0.81%)
E-0 Unsatisfactory	0 (0.00%)
Total:	**124**
Avg:	**3.42**
Std Dev:	**0.71**

***** Please rate our diversity as an agent for your own personal growth***

A-4 Excellent	39 (31.45%)
B-3 Good	57 (45.97%)
C-2 Satisfactory	24 (19.35%)
D-1 Poor	3 (2.42%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.05**
Std Dev:	**0.82**

***** Please rate our diversity as an agent for your own awareness of social concerns***

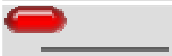
A-4 Excellent	28 (22.58%)
B-3 Good	64 (51.61%)
C-2 Satisfactory	29 (23.39%)
D-1 Poor	2 (1.61%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**2.94**
Std Dev:	**0.77**

***** Please rate the extent to which SCS promoted a healthy learning environment***

A-4 Excellent	51 (41.13%)
B-3 Good	60 (48.39%)
C-2 Satisfactory	9 (7.26%)
D-1 Poor	3 (2.42%)
E-0 Unsatisfactory	1 (0.81%)
Total:	**124**
Avg:	**3.27**
Std Dev:	**0.76**

** Overall rating of eduactional experience at FIU*

A-4 Excellent	273 (36.69%)
B-3 Good	326 (43.82%)

C-2 Satisfactory		133 (17.88%)
D-1 Poor		11 (1.48%)
E-0 Unsatisfactory		1 (0.13%)
Total:		**744**
Avg:		**3.15**
Std Dev:		**0.77**

***** Overall quality of our faculty and instruction***

A-4 Excellent		184 (37.10%)
B-3 Good		232 (46.77%)
C-2 Satisfactory		59 (11.90%)
D-1 Poor		13 (2.62%)
E-0 Unsatisfactory		8 (1.61%)
Total:		**496**
Avg:		**3.15**
Std Dev:		**0.85**

****** Overall rating of preparation upon graduation***

A-4 Excellent		170 (34.27%)
B-3 Good		231 (46.57%)
C-2 Satisfactory		77 (15.52%)
D-1 Poor		15 (3.02%)
E-0 Unsatisfactory		3 (0.60%)
Total:		**496**
Avg:		**3.11**
Std Dev:		**0.81**

******* Overall rating of diversity promotion and environment***

A-4 Excellent		185 (37.30%)
B-3 Good		224 (45.16%)
C-2 Satisfactory		75 (15.12%)
D-1 Poor		9 (1.81%)
E-0 Unsatisfactory		3 (0.60%)

Total:		**496**
Avg:		**3.17**
Std Dev:		**0.79**

Overall satisfaction with BS-CS program objectives

A-4 Excellent		812 (36.38%)
B-3 Good		1013 (45.39%)
C-2 Satisfactory		344 (15.41%)
D-1 Poor		48 (2.15%)
E-0 Unsatisfactory		15 (0.67%)
Total:		**2232**
Avg:		**3.15**
Std Dev:		**0.80**

Appendix F

FIU Student Chapter, Association for Computing Machinery

Prepared by: Kip Irvine

Date: February 12, 2007

ACM Southeast Regional Programming Competition

Our chapter sent two teams to the ACM programming competition, held in Statesboro, Georgia, in October 2006. The teams ranked 7th and 19th overall, out of 65 teams. The teams were coached by Kip Irvine, the club's faculty advisor.

Fourth Annual High-School Programming Competition

In March 2007, the ACM club will be hosting its High School Programming Competition. Last year, 99 students from 15 area high schools participated in the event. This year, the enrollment will be just as good. IBM will be our primary sponsor for the second year in a row, with Pete Martinez, the top IBM regional executive as the guest speaker. Adobe corporation is also giving over $1500 in software. According to Lourdes Whittington, Educational Specialist for Dade-County Public Schools, the FIU competition has created a great amount of enthusiasm among Dade computer students.

Volunteer Tutoring Program

The ACM club organized a volunteer tutoring program in Fall 2006, which continued in Spring 2007. In the Fall semester alone, ten tutors contributed over 70 hours in subjects such as Beginning/Intermediate Java, Data Structures, Unix, Computer Architecture, Software Engineering, and Visual Basic. One member, Ruben Balmaceda, was given the Outstanding Tutor Award in December 2006.

Guest Lecture: Greg Miller, Ultimate Software

Greg Miller, a software engineer from Ultimate Software, visited FIU on the invitation of the ACM club in November 2006. He and a colleage described Agile Software development methodologies and gave a brief demonstration. The lecture was attended by approximatedly 40 students and faculty. As a result of that visit, several FIU students were interviewed for full-time positions.

Student Picnic

ACM and the **Women in Computer Science** club held a very successful picnic for FIU students in Crandon Park in October 2007. Approximately 30 students attended.

LEGO Mindstorms Project

A team of ACM students has been working on software for the LEGO Mindstorms Robot during the Fall 2006 semester. This project was funded by a grant awarded to the Women

in Computer Science club. The project will be demonstrated in the Spring 2007 Engineering Gala, and at two local high schools.

Toy Drive with the Women in Computer Science Club

ACM and WICS students organized a toy drive in December 2006 for the Miami Childrens Hospital. Approximately $400 in toys were delivered to the hospital by students and faculty from both clubs.

Graphics and Games Special Interest Group

The ACM Graphics and Games group had active participation throughout Fall 2006 and early 2007. Dr. Prabhakaran generously donated his time, giving several guest lectures on graphics theory. Students in this group have been working on applications using Open-GL, Microsoft XNA Toolkit, and Perl.

Appendix G

WICS@FIU REPORT for 2006

Throughout the Spring semester of 2006 and the Fall semester of 2006, WICS had a meeting on every other Friday that was not a holiday or vacation. Besides providing regular tutoring to our members (approximately 85 hours per semester) and attending all SOC meetings and leadership seminars, WICS organized and sponsored the following events:

Spring 2006:

- January 13th, WICS meets with Dr. Elein Weyuker (chair of ACM-W and researcher in the AT&T labs) to talk about women's careers and opportunities in Computer Science.
- January 15th, WICS submits a grant proposal to AAUW (American Association of University Women) for the purpose of creating a high school girl computer science club with high school girls from the local high schools.
- January 19th, WICS joins forces with the engineering women organizations to form WIECS – Women in Engineering and Computer Science.
- January 27th, Maria Villar (Vice president, Enterprise Business Information, IBM) gives a lecture, sponsored by WICS, on "Formula for success."
- February 21st, WICS meets with girls from Miami Coral Park Senior High School and forms a computer science high school girl club. The club meets bi-weekly. WICS officers present Wild Divine video game, teach web design and other applications.
- February 27th, WIECS submits grant proposal to EIF (Engineering Information Foundation) for the purpose of recruiting more female students for the College of Engineering and Computing. WICS initiates and leads grant application.
- February 28th, WICS volunteers for the Engineering Gala, and WIECS co-sponsors the event. WICS officers co-present Walking Robot project.
- March 1st, Salim Nasser (graduate student in the College of Engineering) gives lecture, sponsored by WICS: "Design and Development of a Bipedal Humanoid Robot and Gait."
- March 17th, Richard Akirmaian's talk, sponsored by WICS: "Financial advisement: How to make intelligent decisions".
- March 23rd, WICS volunteers for the ACM High School Competition.
- March 31st, Dr. Gerard Klonarides's talk, sponsored by WICS: "Identity theft".
- April 1st, WICS organizes a visit to the CATE lab (Engineering center) for its members and the girls from Coral Park Senior High School.
- April 21st, Dr. Diann Newman's workshop, sponsored by WICS: "Making team decisions by consensus."
- April 21st, EIF (Engineering Information Foundation) grant awarded: $7,740 for the purpose of recruiting more female students to the College of Engineering and Computing.

- April 28th, Irene Polycarpou receives Student Outstanding Service Award at the Annual Engineering Banquet and Award Ceremony for her service to the students and the College of Engineering and Computing.
- May 1st, WICS officers and members attend ROPES course for team building.
- May 2nd, WICS' last meeting with the Coral Park High School girls club. Throughout the semester, girls learned how to build their own website using Microsoft Front Page, were introduced to Wild Divine, and were exposed to the different paths of computer science and engineering, such as artificial intelligence, robotics, and biomedical engineering.

Fall 2006:

- September 15, WICS has its first General Meeting.
- September 21, Irene Polycarpou and Mbola Fanomezantsoa attend the SOC Orientation.
- September 25, WICS attends the SOC Clubs Fair in GC.
- October 10, WICS and WIECS participate in the Title V Mentorship Program. The Mentorship Program will run until the end of Spring 2007. WICS is participating with two teams: the Lego Mindstorm team and the Tutoring team.
- October 13, WICS invites Helen Godfrey, Associate Director of Career Services for Engineering, to talk about resume writing and interviewing skills.
- October 27, WICS invites Prof. Rachelle Heller, Associate Dean for Academic Affairs, Mount Vernon Campus of the George Washington University, to talk about "Interactive Multimedia: What's in it for Computer Science Education." WICS members have a round table with Dr. Rachelle Heller to talk about her career and experiences as a woman in the computer science field.
- October 31, WICS members take an engineering tour of the Bank Atlantic Arena and they attend the hockey game.
- November 1, WICS assists the SCIS during the Engineering day with promoting its programs.
- November 18, WICS, ACM, and UPE organize a picnic at Crandon Park, Key Biscayne.
- December 8, WICS and ACM organize a Christmas Toy Drive. Members of WICS and ACM visit Miami Children's Hospital and donate toys to the children.

Appendix H :

Summary of activities of the SCIS Industry Advisory Board

The Industry Advisory Board for the School held two meetings in calendar year 2006: May 26th and December 15th. Highlights of the members activities with our school are listed below.

- The Latin American Grid Consortium (latinamericangrid.org), co-founded by IBM and FIU in Dec. '05, has grown considerably in the last year. Our partnerships now includes, Tecnologico de Monterrey (Mexico), Universidad de Guadalajara (Mexico), Universidad Nacional de La Plata (Argentina), Instituto Universitario Aeronaútico (Argentina), Florida Atlantic University, University of Miami , University of Puerto Rico at Mayaguez, Barcelona Supercomputing Center (Spain), University of North Florida. Participating members collectively share over 1,000 processors for research experiments using various grid technologies, creating a global living laboratory for cyberinfrastructure enablement. We have held three research summits in '06 where FIU faculty, students and IBM researchers have presented their work in grid resource management, workflow scheduling, cyberinfrastructure enabled Bioinformatics and Hurricane prediction software and other grid related research areas. IBM has committed to support research activities of its staff for the next three years amounting to over $5million in-kind support. IBM has initiated a LA Grid Scholars program which honors our top performing students with mentoring and internship opportunities.
- In Oct. 2006, FIU hosted the IBM Technical Leadership Team (TLT) meeting at its University Park Campus Ballroom. The two day meeting allows the senior executive technical leadership of IBM worldwide, including Research and product development divisions to come to together to direct workforce development strategy. Integral to the meeting was a student panel and poster session which allowed executives to meet our students and understand the challenges they are faced with. Executives were given tours of our research labs to hear students present their research work. This event created significant visibility for our School within the company and provided many employment opportunities for our students.
- Board members agreed to embark on an IT scholarship campaign to assist top FIU computer science and IT students. Board members are charged with marketing the scholarship program to their colleagues, thus increasing the visibility of our school and its students to other executives in the region while raising funds to support top talent which those same companies may recruit. The Board hopes to raise $100K to support at least 15 students with scholarships.
- Board member companies IBM, Siemens, and Ultimate Software provided each several letters of support for NSF grant proposals the School submitted to CISE and other Directorate programs. These letters committed internships, equipment donations, mentoring, and technology R&D activities. We have not been awarded a grant on these proposals: three declined with encouragement to resubmit and

two pending. Reviewers have all comments that our industrial partnerships are very strong and are a key strength of these proposals.