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APPENDIX A-1: BS in CS *Program Educational Objectives* – Effective Fall 2015

<https://abet.cs.fiu.edu/csassessment/bs-cs-program-objectives-outcomes/>

Program Educational Objectives for the BS in CS Program

Graduates of the BS program in Computer Science or Information Technology will

1. Be successful in applying for entry level professional positions in computing-related fields, or for admission to graduate programs.
2. Be prepared for career accomplishment, responsibility and advancement in computing-related professions by virtue of having received in the BS program
 - 2.1. A high-quality technical education in computing,
 - 2.2. Communication and team-work skills,
 - 2.3. Awareness of the ethical and social responsibilities of their profession,
 - 2.4. An ability to engage in continued professional development activities.

APPENDIX A-2: BS in CS *Student Outcomes* – Effective Fall 2015

<https://abet.cs.fiu.edu/csassessment/bs-cs-program-objectives-outcomes/>

Student Outcomes for BS in CS Program

Graduates of the BS program in Computer Science will attain, by the time of graduation

- (a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- (d) An ability to function effectively on teams to accomplish a common goal.
- (e) An understanding of professional, ethical, legal, security and social issues and responsibilities.
- (f) An ability to communicate effectively with a range of audiences.
- (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- (h) Recognition of the need for and an ability to engage in continuing professional development.
- (i) An ability to use current techniques, skills, and tools necessary for computing practice.
- (j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- (k) An ability to apply design and development principles in the construction of software systems of varying complexity.

APPENDIX B-1: BS in CS Assessment Plan

SCHOOL OF COMPUTING AND INFORMATION SCIENCES
ASSESSMENT PLAN
of the
Bachelor of Science in Computer Science Program

I. INTRODUCTION

The document, Assessment Mechanisms and Procedures, of the School of Computing and Information Sciences (SCIS), describes the means by which the School conducts the biennial assessment of its BS in Computer Science program. The instruments employed for assessment, and the SCIS administrative structure for performing the assessment are described in that document. These means include:

- Survey Instruments
 1. Course Outcomes Survey by Students
 2. Course Outcomes Survey by Instructors
 3. Survey of Graduating Students
 4. Survey of Alumni
 5. Survey of IAB members and Employers

- Recommendations from constituents
 1. Industry Advisory Board (IAB)
 2. Women in Engineering and Computer Science (WIECS)
 3. ACM Student Chapter
 4. Students in Technology, Academia, Research, and Service Group (STARS)

- Direct Measures
 1. Senior Project Assessment
 2. Course-Embedded Assessment

The administrative structure for conducting the assessment comprises

- The Undergraduate Program Director (UPD)
- The Assessments Coordinator (AC)
- The Subject Area Coordinators (SACs)

The assessment procedures are performed by the SCIS Subject Area Coordinators and the SCIS Assessments Coordinator. Their findings are reported to the SCIS Undergraduate Committee for evaluation, resulting in a set of recommendations to the SCIS faculty.

This document, the SCIS Assessment Plan, defines the implementation of the entire assessment cycle. It specifies the roles of all participants in the process, and sets out a timetable for execution of those roles.

II. PARTICIPANTS

1) The Undergraduate Program Director (UPD)

The Undergraduate Program Director is appointed by the Director of SCIS. The UPD bears overall responsibility for the administration of all SCIS undergraduate programs.

The role of the UPD relevant to the assessment process is

- To designate the chair of the SCIS Undergraduate Committee (below)
- To ensure that the assessment timetable is followed and that the procedures are otherwise executed as set forth in this document and in the Assessments Mechanisms and Procedures Document
- To document and implement program adjustments arising from the biennial assessment process that are approved by the SCIS faculty and, if necessary College and University Curriculum Committees.

2) The Subject Area Coordinators (SACs)

The Subject Area Coordinators may be appointed by the UPD or elected by the SCIS faculty. Each SAC bears responsibility for a group of courses in the BS in Computer Science curriculum:

Foundations Subject Area courses:

MAD 2104, MAD 3512, COP 4534, COP 4555, COT 3420

List 2 electives: MAD 3305, MAD 3401, MAD 4203, MHF 4302

Programming Subject Area courses:

COP 2210, COP 3337, COP 3530, COP 4226, COP 4338, COP 4520

Software Engineering Subject Area courses:

CEN 4010, CEN 4021, CEN 4072, CIS 4911

Computer Organization Subject Area courses:

CDA 3103, CDA 4101, CNT 4713, COP 4610

Computer Systems Subject Area courses:

CAP 4453, CAP 4770, COP 4604, CEN 4083, COP 4710, COP 4722

Professional Development Subject Area courses:

CGS 1920, CGS 3095, ENC 3249

Calculus and Physics Area courses:

MAC 3311, MAC 3312, PHY 2048(L), PHY 2049(L), STA 3033

The above lists will be modified as and when needed to reflect the changing requirements of the Program or addition of new area-specific courses. The UPD and SACs will be responsible to suggest these area-specific modifications.

The role of a Subject Area Coordinator is:

- To maintain a common syllabus for each SCIS course in their area.
- To maintain the instruments and rubrics for course-embedded assessment in their area
- To liaise with the academic unit teaching a non-SCIS course that is a required or elective course in the BS in CS program.

- To interpret the data from the Student and Instructor Course Outcomes surveys for each course in their area.
- To prepare a biennial report presenting the findings from the course surveys, and to make recommendations based on these findings.

3) The Assessments Coordinator (AC)

The Assessments Coordinator is appointed by the SCIS Director. The role of the AC is:

- To interpret the data from the Survey of Graduating Students, Senior Project assessment, and Alumni survey.
- To prepare the SCIS biennial assessment report every odd year (2013-14). The report presents the data from these assessment mechanisms and resulting findings and recommendations, and summarizes the recommendations from SAC reports.
- To monitor the BS in CS program for compliance with the ABET accreditation criteria.
- To prepare the ABET accreditation self-study report, and program documentation as may be required by ABET.

The Assessments Coordinator should not simultaneously be a Subject Area Coordinator, except for the Calculus and Physics area (liaison).

4) The Undergraduate Committee (UGC)

The Undergraduate Committee may be appointed by the SCIS Director or elected by the SCIS faculty. The UGC Chair convenes and conducts all UGC meetings as necessary. The Undergraduate Program Director and Assessments Coordinator are ex-officio members of the Undergraduate Committee.

The UGC has the responsibility of considering proposed changes to the existing SCIS undergraduate courses and programs, and of making recommendations, based on these considerations, to the full SCIS faculty.

The role of the UGC in the assessment process specifically, is to consider the AC's biennial assessment report. Each AC or SAC recommendation contained in the biennial report is evaluated by the UGC. Where helpful, the UGC may require further input or clarification from the author (AC or SAC) of a recommendation. At the conclusion of their deliberations, the UGC chair prepares a summary of recommendations for presentation to the SCIS faculty. In the summary:

- The UGC may endorse an AC or SAC recommendation for adoption by the SCIS faculty.
- The UGC may endorse an AC or SAC recommendation and propose to the SCIS faculty a means of enacting the recommendation.
- The UGC may decline to act on a recommendation, setting forth reasons for its decision.
- The UGC may author its own recommendations to the SCIS faculty.

5) The SCIS Faculty

The SCIS faculty, collectively, has sole responsibility for promulgating and modifying its academic programs. The SCIS faculty approves or rejects any recommendations for adjustments to the BS in

Computer Science program. Adoption of SCIS approved program adjustments may be subject to final approval of College and University Curriculum Committees.

III. SCHEDULE

1) Surveys

The schedule for administering Course Outcomes, Graduating Students and Alumni surveys is set out in the SCIS Assessment and Mechanisms document. All surveys are carried out on-line. The SCIS Director for IT and Business Relations has the responsibility of ensuring that the data from any survey is available within one month of conclusion of the survey.

2) Direct Measures Assessment

Senior Projects are presented at the end of every semester. The resulting assessment data are collected by the Senior Project coordinator and are available by the start of the following semester. Data from the course-embedded assessments are prepared by the SAC's and are made available by the start of the next semester.

3) Subject Area Coordinator Biennial Reports

The SAC biennial reports cover the Summer, Fall, and Spring semesters of two previous years. These reports are made available to the Assessments Coordinator by the end of September of every odd year.

4) Recommendations from Constituents

Recommendations from IAB, WIECS, ACM Chapter, or other constituent group are provided to the assessments Coordinator no later than the end of September of every odd year.

5) Assessment Coordinator Biennial Report

The AC biennial report incorporates data and recommendations from all of the sources listed above. The report covers the period of two years (six semesters) and is made available to the Undergraduate Committee by the end of the Fall term of every odd year.

6) Undergraduate Committee Summary of Recommendations

UGC meetings to consider the biennial assessment report are conducted during the first two months of the Spring term of every even year. UGC concludes all deliberations, and the UGC summary of recommendations is made available to the SCIS faculty by the end of February of every even year.

The UGC chair should prioritize recommendations for adjustments to the BS in CS program that require further approval by the College Curriculum Committee. The SCIS Director and/or UPD should expedite SCIS faculty consideration of such recommendations, bearing in mind the deadlines of the College Curriculum Committee, and with a view to implementation at the start of the next academic year.

7) SCIS Faculty Assessment Meeting

The SCIS Director convenes a meeting of the SCIS faculty to consider the UGC recommendations prior to the end of the Spring semester of every even year, if practical, but no sooner than one week following receipt of the UGC summary of recommendations. Should matters be left over from this

meeting, such matters should be addressed during the first meeting of the full SCIS faculty in the following Fall semester.

IV. ENACTMENT

- UGC recommendations not requiring faculty approval must be considered by the responsible entity, SAC or UPD, immediately and reported to the next meeting of the full SCIS faculty. The Director or the Associate Director of the School may veto such recommendations if they are deemed to be impractical to implement.
- UGC recommendations approved by the SCIS faculty, and not requiring further approval by the College, must be enacted by the UPD as soon as practicable, and by the start of the following Summer semester if at all possible.
- Recommendations for BS in CS program adjustments approved by the SCIS faculty, and subsequently approved by the College and/or University Committees, must be enacted at the earliest possible date following approval by the highest Committee.

The Undergraduate Program Director has overall responsibility for enactment of all program adjustments resulting from the assessment process. The UPD is charged with documentation and publication of program adjustments.

Revised: February 19, 2015

APPENDIX B-2: BS in CS *Assessment Mechanisms & Procedures*

SCHOOL OF COMPUTING AND INFORMATION SCIENCES ASSESSMENT MECHANISMS AND PROCEDURES of the Bachelor of Science in Computer Science Program

I. INTRODUCTION

The School of Computer and Information Sciences (SCIS) at Florida International University uses several mechanisms to assess the extent to which its undergraduate program outcomes and objectives are being met. Further, the School has defined procedures to evaluate the assessment results and to identify ways to improve its curriculum based on the assessment results, as deemed necessary and appropriate by its faculty.

SCIS currently uses five survey instruments:

1. Course Outcomes Survey by Students
2. Course Outcomes Survey by Instructors
3. Survey of Graduating Students
4. Survey of Alumni
5. Survey of IAB members and Employers

Direct measure of attainment of the Program Educational Objectives is performed by assessment of student performance in the Senior Project course (Capstone course) taken in the students' final semester.

In addition to the data from the survey instruments and Senior Project assessment, SCIS seeks recommendations from other constituents of the BS in CS program, including the Industrial Advisory Board, Women in Engineering and Computer Science group, Students in Technology, Academia, Research, and Service group, and the ACM student chapter.

II. ADMINISTRATIVE STRUCTURE

To administer and evaluate these assessments, SCIS has created an administrative structure that includes:

- the Undergraduate Program Director (UPD),
- the Assessments Coordinator (AC),
- the Subject Area Coordinators (SACs)

The Undergraduate Program Director is appointed by Director of the School.

The Assessments Coordinator and the Subject Area Coordinators are appointed by the Undergraduate Program Director.

Each course in the BS in Computer Science program falls under one of five subject areas, each with its own SAC: Programming, Software Engineering, Computer Systems, Foundations, and Communication & Ethics. Each Subject Area Coordinator is responsible for writing a biennial report detailing recommendations for modifications pertaining to all courses in their respective subject area.

The Assessments Coordinator is responsible for writing a biennial report summarizing the recommendations of the SACs, and recommendations received from the other program constituents. The AC's report is submitted to the SCIS Undergraduate Committee for consideration.

On consideration of the AC and SAC reports, the SCIS Undergraduate Committee may subsequently make recommendations to the full SCIS faculty. Recommendations adopted by the SCIS faculty are implemented via the normal academic procedures of the university.

The Undergraduate Program Director 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, SCIS utilizes data from the survey instruments and Senior Project evaluation, and recommendations from its constituent groups, to assess whether the program outcomes and objectives of the BS in Computer Science program are being met. The details of these assessment mechanisms, and their application, are described below.

A. SURVEY INSTRUMENTS:

SCIS currently uses five survey instruments. All surveys are conducted online. The SCIS Director for IT and Business Relations is responsible for ensuring that meaningful statistics for each survey are available within a month after the survey period concludes.

The student and instructor Course Outcomes Survey statistics are analyzed and reported in the biennial reports of the Subject Area Coordinators.

The Graduating Students and Alumni survey statistics are analyzed and reported in the biennial report of the Assessments Coordinator.

1. Course Outcomes Survey by Students

This survey is undertaken during the final two weeks of every semester.

Students of every class offered during the semester are asked to rate each course outcome from two perspectives by indicating the extent to which they agree or disagree with two assertions about that outcome:

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

Responses are given on a scale of 1 to 5 with 5 indicating strong agreement with the assertion, and 1 indicating strong disagreement. The students' responses from both perspectives, *value of outcome* and *adequacy of coverage* are averaged across the class, individually for each outcome, and cumulatively for all outcomes

2. Course Outcomes Survey by Instructors

This survey is undertaken at the conclusion of every semester.

For each class offered during any semester, the instructor of the class completes a grid showing how course assignments and tests relate to the individual course outcomes. The instructor rates each course outcome from two perspectives:

- The *appropriateness* of the outcome is rated as one of *essential*, *appropriate*, or *inappropriate*.
- The in-class coverage of the outcome is rated as one of *extensively*, *adequately*, *not enough*, or *not at all*.

The instructor also provides ratings of the *relevance* and *student mastery* of the *course prerequisite outcomes*, and may choose to provide recommendations for additional prerequisite outcomes.

3. Survey of Graduating Students (Student Outcomes)

This survey is undertaken every semester, during the final two weeks of the semester.

The graduating student is asked to rate each of the BS in Computer Science (curricular) Student Outcomes *a* through *k*, from two perspectives.

- The graduating student indicates the extent to which they agree or disagree with the following assertion:
This program outcome has been met for me personally
- The graduating student indicates how meaningful they consider the outcome to be:
How meaningful do you consider this outcome to be for you personally?

Program Educational Objectives *i* and *j* relate to the success of the graduating student in finding CS-related employment, and admission to graduate school respectively. For each of these 2 outcomes, *i* and *j*, the student indicates how successful they have been, and how their CS education has contributed to that success.

Responses to all questions are given on a scale of 0 through 5, with 0 being least favorable, and 5 being most favorable, and are averaged across all students completing the survey.

4. Survey of Alumni (Program Educational Objectives)

This survey is undertaken by graduates of the BS in Computer Science program, and is conducted every three years.

Alumni completing this survey are asked to provide ratings of the several facets of the BS in Computer Science Program Educational Objectives under four broad areas:

- quality of Educational Experience (6 facets)
- quality of Faculty and Instruction (4 facets)
- quality of preparation in the Curricular Areas (4 facets)
- promotion of Diversity and Healthy Environment (4 facets)

Each facet is rated on a scale of 0 (Unsatisfactory) through 4 (Excellent). The ratings are averaged for each individual facet (18), for each area (4), and cumulatively across all facets.

5. Survey of Employers (Program Educational Objectives)

This survey is undertaken by employers of students who received their BS in CS degree from our School. It is conducted once every three to four years.

Employers completing this survey are asked to provide ratings of our students' performance and abilities that are included in the Program Educational Objectives. These are:

- mastery of the fundamental computer science concepts and problem solving using them
- ability to communicate verbally
- ability to communicate in written form
- ability to work cooperatively in a team
- understanding of social and ethical concerns of a practicing computer scientist
- ability to learn emerging and new concepts and technologies

Each aspect is rated on a scale of 0 (Poor) through 4 (Excellent). Average ratings are used for assessment purposes.

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 biennial report submitted by the AC to the School's curriculum committee.

1) Industry Advisory Board (IAB):

The IAB of the School is expected to meet twice 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) Women in Engineering and Computer Science (WIECS) group:

The WIECS 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 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 into our program. The AC and the UPD review the recommendations of the group on a biennial 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 are reviewed by the AC and the UPD on a biennial basis.

4) Students in Technology, Academia, Research, and Service (STARS) group:

The members of STARS meet periodically throughout the year. Recommendations made by this group through their faculty advisor are reviewed by the AC and the UPD on a biennial basis.

C. DIRECT MEASURES

1. Senior Project Assessment

For the purpose of assessing the BS in CS Program Educational Objectives via the Senior Project, the UPD, in consultation with the faculty, constitutes an evaluation team(s) of at least 3 persons to include

1. The Senior Project course coordinator/instructor (faculty),
2. A second faculty member not associated with the project,
3. A non-faculty representative from the SCIS Industry Advisory Board, or person with similar experience nominated by the Board.

Several such teams may be constituted, based on the number of student projects to be evaluated.

The evaluation team observes the students' oral presentations and/or demonstrations of their project. The evaluation team has access to all artifacts produced by the student team to satisfy the requirements of the Senior Project course.

The members of the evaluation team complete a suitable instrument to indicate their assessment of the extent to which the students' work demonstrates attainment of the BS in Computer Science Program Educational Objectives. The instrument includes rubrics to guide their evaluations. The instrument and included rubrics must be published.

The completed evaluation instruments, together with the project artifacts, become components of the assessment process, and must be maintained until at least the following ABET accreditation site visit.

2. Course-Embedded Assessment

In addition to assessment via the Senior Project, the Undergraduate Program Director and Assessments Coordinator, in consultation with the relevant Subject Area Coordinators, may designate courses for sampling of student work (exams and/or projects), for the purpose of assessing attainment of Student Outcomes. The particular courses to be sampled may be determined from semester to semester. The Subject Area Coordinators will maintain suitable sampling mechanisms and rubrics for assessment of Student Outcomes via the courses in their areas.

IV. IMPLEMENTING CURRICULUM CHANGES:

The Assessment Coordinator's biennial written report is submitted to the SCIS Undergraduate Committee by the end of Fall term of every odd year. The report includes recommended curriculum modifications based on all of the assessment mechanisms. The SCIS Undergraduate Committee completes all internal deliberations in the School by the end of February of every even year. The SCIS faculty considers these recommendations by the end of the Spring term of every even year if practical. In the worst case, the faculty considers them in early Fall term of every even year. The faculty approved changes in our curriculum are submitted to the College Curriculum Committee at the earliest possibility. The University approved curriculum modifications are implemented no later than in the subsequent Fall semester.

Revised: February 19, 2015

APPENDIX C: Subject Area Coordinator Reports

Computer Organization: Area Coordinator Report

Nagarajan Prabakar

October 25, 2017

Introduction:

The Computer Organization area consists of the following four courses: CDA-3103 (Fundamentals of Computer Systems), CDA-4101 (Structured Computer Organization), CNT-4713 (Net-Centric Computing), and COP-4610 (Operating Systems Principles). The assessment report given below for each of these courses is based on student responses about the course outcomes and the faculty course appraisals.

1. CDA-3103: Fundamentals of Computer Systems

The following table shows a summary of the course assessment evaluations:

	<u>No. of Student</u>	<u>Value of</u>	<u>Coverage</u>	
	<u>Responses</u>	<u>Outcome</u>	<u>Adequacy</u>	<u>Professor</u>
Summer 2015	25	4.66	4.63	Pestaina
Fall 2015	74	4.62	4.62	Pestaina & Cickovski
Spring 2016	68	4.43	4.55	Pestaina & Cickovski
Summer 2016	2	5.00	5.00	Pestaina
Fall 2016	71	4.60	4.64	Pestaina & Cickovski
Spring 2017	12	4.73	4.61	Pestaina & Cickovski
	=====	=====	=====	
Total	252	4.58	4.61	Weighted Avg

For all five outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed in the Students Suggestions section.

Recommendation: From instructor course appraisals, students seem to be deficient in Boolean logic and problem solving skills. These deficiencies need to be addressed in introductory CS courses. Using interactive textbooks (Zybooks) improves student learning.

2. CDA-4101: Structured Computer Organization

The following table shows a summary of the course assessment evaluations:

	<u>No. of Student</u>	<u>Value of</u>	<u>Coverage</u>	
	<u>Responses</u>	<u>Outcome</u>	<u>Adequacy</u>	<u>Professor</u>
Summer 2015	7	4.51	4.06	Prabakar
Fall 2015	42	4.54	4.52	Downey & Cickovski
Spring 2016	45	4.74	4.63	Downey & Cickovski
Summer 2016	18	4.53	4.30	Prabakar
Fall 2016	60	4.67	4.58	Cickovski & Prabakar
Spring 2017	8	4.57	4.43	Cickovski & Pestaina

	=====	=====	=====	
Total	180	4.63	4.52	Weighted Avg

For all five outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed by the students or faculty.

Recommendation: From instructor course appraisals, course outcomes need to be revised with advanced architecture topics.

3. **CNT-4713: Net-Centric Computing**

The following table shows a summary of the course assessment evaluations:

	<u>No. of Student</u>	<u>Value of</u>	<u>Coverage</u>	
	<u>Responses</u>	<u>Outcome</u>	<u>Adequacy</u>	<u>Professor</u>
Summer 2015	11	4.53	4.51	Downey
Fall 2015	26	4.78	4.61	Liu
Spring 2016	43	4.56	4.22	Bobadilla & XinSun
Summer 2016	10	4.74	4.60	Downey
Fall 2016	35	4.76	4.56	Downey
Spring 2017	29	4.40	3.98	Ortega
	=====	=====	=====	
Total	154	4.62	4.36	Weighted Avg

For all seven outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed by the students or faculty.

Recommendation: No change is needed on the course outcomes or syllabus.

4. **COP-4610: Operating Systems Principles**

The following table shows a summary of the course assessment evaluations:

	<u>No. of Student</u>	<u>Value of</u>	<u>Coverage</u>	
	<u>Responses</u>	<u>Outcome</u>	<u>Adequacy</u>	<u>Professor</u>
Summer 2015	20	4.77	3.93	Osorio
Fall 2015	8	4.68	4.85	Wei
Spring 2016	14	4.70	4.57	Prabakar
Summer 2016	3	5.00	3.67	Osorio
Fall 2016	23	4.70	4.12	Ortega
Spring 2017	6	4.47	4.30	Prabakar
	=====	=====	=====	
Total	74	4.71	4.23	Weighted Avg

For all five outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed by the students or faculty.

Recommendation: No change is needed on the course outcomes or syllabus.

Computer Programming: Subject Area Coordinator Report

Tim Downey
October 30, 2017

Subject Area: Programming

COP 2210 Computer Programming I
COP 3337 Computer Programming II
COP 3530 Data Structures
COP 4226 Advanced Windows Programming
COP 4338 Computer Programming III
COP 4520 Introduction to Parallel Computing

The assessment report for each of these courses is based on student responses about the course outcomes and the faculty course appraisals.

COP2210 - Computer Programming I

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Summer 2015	42	4.47	4.29	Pestaina, Smith, Charters
Fall 2015	72	4.34	3.86	Rahn, Milani
Spring 2016	100	4.45	4.17	Rahn, Milani, Davis
Summer 2016	0	0.00	0	Pestaina
Fall 2016	123	4.42	4.35	Shaw, Rahn
Spring 2017	0	0.00	0	Shaw
Total	337	4.42	4.18	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. The exception was in Fall 2015 when a flipped classroom was tried. The coverage was only rated at 73%.

Recommendation: From instructor course appraisals, students seem to be deficient in mathematical preparation for the course. Adding a pre-requisite of Algebra might be considered. One instructor feels that outcomes for Javadocs and program style should be added to the course.

COP3337 - Computer Programming II

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Summer 2015	34	4.59	4.04	Smith
Fall 2015	114	4.71	4.56	Bajuelo, Smith, Charters, Pelin
Spring 2016	90	4.37	4.13	Bajuelo, Field, Navlakha, Pelin, Wells
Summer 2016	15	4.49	4.37	N/A
Fall 2016	106	4.51	4.26	Bajuelo, Shaw, Pestaina, Charters

Spring 2017	9	4.76	4.21	Smith, Field, Navlakha, Shaw
Total	368	4.55	4.30	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. The exceptions were in Summer 2015 and Spring 2016, when coverage was only rated at 77% and 75%. There is no apparent reason for the lack of coverage.

Recommendation: From instructor course appraisals, students seem to be deficient in algorithmic reasoning, problem solving, ArrayLists, Strings and methods. Instructors note a wide range of skills. COP2210 instructors should be encouraged to cover all course outcomes. A lab should be considered for this course.

COP3530 - Data Structures

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Summer 2015	27	4.80	4.45	Bajuelo
Fall 2015	81	4.74	4.61	Bajuelo
Spring 2016	65	4.74	4.65	Bajuelo, Pelin
Summer 2016	22	4.89	4.6	Bajuelo
Fall 2016	58	4.70	4.56	Bajuelo
Spring 2017	7	4.61	4.38	Bajuelo
Total	260	4.75	4.59	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed in the Students Suggestions section.

Recommendation: From instructor course appraisals, students seem to be deficient in linked lists, stacks, collections and recursion. COP3337 instructors should plan their courses appropriately to leave time to cover these topics.

COP4226 - Advanced Windows Programming

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Fall 2015	13	4.69	4.35	Downey
Fall 2016	14	4.74	4.77	Downey
Total	27	4.72	4.57	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed in the Students Suggestions section.

Recommendation: No change is needed on the course outcomes or syllabus.

COP4338 - Computer Programming III

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Summer 2015	13	4.78	4.82	Milani, Ortega
Fall 2015	55	4.63	3.77	Rahn, Field, Milani
Spring 2016	87	4.46	3.6	Rahn, Field
Summer 2016	16	4.71	4.29	N/A
Fall 2016	70	4.58	4.27	Rahn
Spring 2017	11	4.96	4.14	Rahn, Field
Total	252	4.58	3.95	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. The exceptions were in Fall 2015, Spring 2016 and Fall 2016, when coverage was only rated at 68%, 60% and 75%. Many students commented on an outdated book.

Recommendation: From instructor course appraisals, students seem to be deficient in experience with algorithms and Unix. Several instructors did not cover the debugging outcome. Since Unix and debugging with GDB are not taught in our curriculum, the course outcomes need to be adjusted to make time to cover these topics. COP3530 is a co-requisite for the course, perhaps it should be a prerequisite. A newer book that covers more of the outcomes should be found.

COP4520 - Introduction to Parallel Computing

	# Responses	Value of Outcome	Coverage Adequacy	Instructor
Spring 2016	10	4.88	4.88	Liu
Total	10	4.88	4.88	Weighted Average

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed in the Students Suggestions section.

For the outcomes of the course, most of the students (more than 80%) agree either strongly or moderately. There is no significant concern expressed in the Students Suggestions section.

Recommendation: No change is needed on the course outcomes or syllabus.

Assessment of 2015 - 2017 Foundations Courses

Xudong He
October 23, 2017

1 Introduction

The Foundations courses are COT 3541 (Logic for Computer Science), COP 4555 (Principles of Programming Languages), COT 4534 (Algorithm Techniques), COT 4521 (Introduction to Computational Geometry), MAD 2104 (Discrete Mathematics), MAD 3512 (Theory of Algorithms), and the math electives. There are no students' evaluations and no instructor appraisals from these two Math Department courses.

2 COT 3541 Logic for Computer Science

Christine Lisetti taught a section COT 3420 in Fall 2015, Spring 2016. Alex Pelin taught a section of COT 3541 in Fall 2015, Fall 2016, Spring 2017. Antonio Bajuelos taught a section in Summer 2015, Spring 2016, Fall 2016, Spring 2017; and two sections in Summer 2016.

The following table shows a summary of the student evaluations:

	<u>#</u> <u>Responding</u>	<u>Outcome</u> <u>Value</u>	<u>Coverage</u> <u>Adequacy</u>
Summer 15 (Bajuelo)	22	4.59	4.69
Fall 16 (Lisetti)	25	4.61	4.52
Fall 16 (Pelin)	3	4.33	4.17
Spring 16 (Bajuelo)	20	4.75	4.72
Spring 16 (Lisetti)	23	4.39	4.02
Summer 15-1 (Bajuelo)	13	4.79	4.63
Summer 15-2 (Bajuelo)	6	4.96	5.00
Fall 2016 (Bajuelo)	23	4.73	4.74
Fall 2016 (Pelin)	11	4.05	3.11
Spring 2017 (Bajuelo)	4	5.00	5.00
Spring 2017 (Pelin)	1	3.25	4.25
	=====	=====	=====
Year 2015-17	151	4.59	4.46

Overall the evaluations are excellent. Comments with Antonio Bajuelos' teaching were very positive and several students mentioned him as an excellent professor. Some suggestions included more practice problems, more sample problems with solutions, more programming assignments, more projects, more time for assignments, and better homework for exam reviews. Some student mentioned significant overlap between this course and the discrete math course (a prerequisite).

Comments with Alex Pelin's teaching were requiring homework assignments, using less complicated examples, providing more in depth explanations, and using a good textbook. Comments with Christine Lisetti's teaching were needing a textbook, providing more homework assignments, having more consistent grading, and providing quicker responses to emails.

Antonio Bajuelos commented that this course has effectively challenged students to think and informed students about the wide applicability of logic in many computer science areas; and he put much effort in applying the theory to formally solve problems in Prolog. Both Alex Pelin and Christine Lisetti noted that the students did not have adequate preparation.

3 COP 4555 Principles of Programming Languages

Jai Navlakha taught one section of COP 4555 in Fall 2015, Fall 2016. Geoff Smith taught one section of COP 4555 in Fall 2015, Spring 2016, Fall 2016, and Spring 2017. Radu Jianu taught one section of COP 4555 in Spring 2016. Xudong He taught one section of COP 4555 in Summer 2015, Summer 2016. Tim Downey taught two sections of COP 4555 in Spring 2017.

The following table shows a summary of the student evaluations:

	<u>#</u> <u>Responding</u>	<u>Outcome</u> <u>Value</u>	<u>Coverage</u> <u>Adequacy</u>
Summer 15 (He)	6	4.42	4.91
Fall 15 (Navlakha)	19	4.65	4.69
Fall 15 (Smith)	16	4.66	4.80
Spring 16 (Jianu)	14	4.06	3.14
Spring 16 (Smith)	20	4.70	4.69
Summer 16 (He)	18	4.51	4.59
Fall 16 (Navlakha)	18	4.56	4.62
Fall 16 (Smith)	13	4.64	4.83
Spring 17 (Smith)	5	4.47	4.47
Spring 17-1 (Downey)	2	4.75	4.00
Spring 17-2 (Downey)	2	4.50	4.67
	=====	=====	=====
Year 2015-17	133	4.55	4.35

The overall student evaluations were very good. Comments with Xudong He’s teaching included providing more examples, using a different functional programming language, adding a TA, and requiring Algorithm Techniques as a prerequisite. Comments with Jai Navlakha included using online homework submission, giving simpler problems to solve and additional ungraded homework, using a textbook, and using quizzes. Comments with Geoffrey Smith’s teaching included a very interesting and great course, well formatted and comprehensive and detailed class notes. Some suggestions included using a different language instead of F#, providing more practice problems for F#, using smaller and more homework assignments, and practicing questions for exams. Comments with Radu Jianu’s teaching were quite negative, including more preparations in teaching the course. Comments with Tim Downey’s teaching included doing more in-class practices, and requiring graded homework assignments.

Students’ preparation for this course ranges from deficient (Summer 15 – He, Spring 17 - Smith), adequate (Summer 16 – He, Fall 15 – Smith, Spring 16 – Jianu, Spring 16 – Smith, Fall 16 - Smith), to good (Fall 15 - Navlakha, Fall 16 – Navlakha, Spring 17 - Downey). Geoff Smith commented on there were two groups of

students – one groups doing very well and the other did badly. It was not clear whether there would be a solution to this. Geoff Smith was concerned about the class attendance around 50%. Geoff Smith also liked the idea of developing a lot of on-line quizzes for student to practice. Geoff Smith noted the positive effect of grading based on effort. Geoff Smith was unhappy about the student quality and effort in Spring 2017 class. Xudong He commented that the students in summer 2015 were deficient and only one A range grade was given in a class of 11 students. Using quizzes helped students to better learn concepts; however the homework assignments did not help students to understand recursion much since many students just using existing solutions. Overall students performed better in summer 2016.

4 COT- 4534 Algorithm Techniques

Ning Xie taught one section of COP 4534 in Fall 2015, Spring 2016, and Spring 2017. Alex Pelin taught one section of COP 4534 in Fall 2016.

The following table shows a summary of the student evaluations:

	<u>#</u> <u>Responding</u>	<u>Outcome</u> <u>Value</u>	<u>Coverage</u> <u>Adequacy</u>
Fall 15 (Xie)	9	4.37	3.42
Spring 16 (Xie)	10	4.80	4.80
Fall 16 (Pelin)	12	4.19	3.43
Spring 17 (Xie)	8	4.83	4.54
	=====	=====	=====
Year 2015-17	39	4.52	4.01

The overall student evaluations were between good and very good. Comments with Ning Xie’s teaching included structuring the course contents based on the textbook and assigning homework to help understanding and exams in Fall 2015, and excellent course and professor in Spring 2016. Comments with Alex Pelin’s teaching included following textbook more closely, and providing additional resources (references) for contents not covered in the textbook.

Students’ preparation for this course ranges from deficient (Spring 16 and Fall 16) to adequate (Fall 15 and Spring 2017). Ning Xie commented to have basic calculus and combinatorics, linear algebra, probability, and discrete math as prerequisites.

5 COT- 4521 Introduction to Computational Geometry

Wei Zeng taught one section of COP 4521 in Fall 2015.

The following table shows a summary of the student evaluations:

	<u>#</u> <u>Responding</u>	<u>Outcome</u> <u>Value</u>	<u>Coverage</u> <u>Adequacy</u>
Fall 15 (Zeng)	2	5.00	4.73
	=====	=====	=====

Year 2015-17

2

5.00

4.73

The overall student evaluations were excellent, though the sample was really small. The only comment with Wei Zeng's teaching was to use less power points and providing more compact lectures.

Wei Zeng commented to require data structure and linear algebra as prerequisites, and to use term projects related to real applications.

6 Recommendations

There are a few common problems in the above foundation courses, including (1) deficiency of students' preparation and (2) how to help students to better understand course materials and prepare for exams. One possible solution to the problem (1) is offering own Discrete Math course, which has started last year. We will see the impact of the discrete math course in our next round assessment. To address problem (2), homework grading criteria need to be changed to discourage homework copying and encourage student efforts; and quizzes are used to improve students understanding of fundamental concepts and performance on exams.

Professional Development Subject Area Report

Prepared Fall 2017 by Caryl Rahn

This report covers the period from Fall 2015 through Summer 2017. It summarizes and analyzes the data from the SCIS Course Evaluation System's Course Outcomes Surveys for the BS-CS courses in the Professional Development subject area:

CGS-1920 Introduction to Computing
CGS-3095 Technology in the Global Arena – GL
ENC-3249 Professional and Technical Writing for Computing

The Course Outcomes Survey is intended to be completed at the end of each semester by each student registered in any required or elective course of the BS-CS major. Students are surveyed on aspects of the course delivery, and on the value and coverage of each course outcome. The assessment report given below for each of these courses is based on student responses about the course outcomes and the faculty course appraisals.

Review of CGS 1920

	No of Student Responses	Value of Outcome	Coverage Adequacy
Fall2015	840	4.59	4.55
Spring 2016	63	4.66	4.52
Summer 2016	N/A		
Fall 2016	77	4.55	4.40
Spring 2017	63	4.65	4.62
Summer 2017	N/A		
Total:	1043	4.61	4.52

More than half of the students in this course are not pursuing SCIS degrees (97% FA15, 89% SP16, 100% FA16, and 100% SP17), and view the outcome: "Be familiar with the scope of degree programs in the computing field" very favorably. The majority of the student comments were very positive and appear to have found this course valuable for their future college experience and future jobs. A small minority of the students felt that they wanted more of an introduction to coding, but this would be covered in a different class.

Recommendation: No changes are recommended.

Review of CGS 3095

	No of Student Responses	Value of Outcome	Coverage Adequacy
Fall2015	568	4.66	4.66
Spring 2016	184	4.91	4.91
Summer 2016	235	4.82	4.72
Fall 2016	128	4.91	4.91
Spring 2017	73	4.65	4.62
Summer 2017	72	4.64	4.73
Total:	1260	4.77	4.76

A minority of SCIS students objected to the course and felt its position in their major was not adequately justified. The majority of the students strongly felt the course was beneficial. A few students felt that there were too many assignments and activities. A few commented that a text was needed.

Recommendation: Suggestion is to remove the programming prerequisite.

Review of ENC-3249

There was no CES Assessment data for this course. Since technical writing is required in the CGS 3095 course and since the research paper requirement was well received by the students in the GL course, it appears that the outcomes of ENC 3249 were adequately met from the students' perspective. However, CGS 3095 instructors were surveyed each term regarding prerequisites. Their assessment was that although ENC 3213 Professional and Technical Writing was highly useful to useful, students were deficient to adequate in writing skills.

Recommendation: No changes are recommended.

Subject Area: Software Engineering
(Coordinated by Monique Ross)

CEN 4010 – Software Engineering I

- Summary of Assessment:**

This course was taught in every semester during the past two years. According to all the instructors of this course, the relevancy of the prerequisites was rated from useful to highly useful and mastery of the students was rated from adequate to good. Students’ preparedness was indicated as deficient, good, or adequate.

SE I CEN 4010	Prerequisite				Student Preparedness
	Programming		Data Structures		
	Relevance	Mastery	Relevance	Mastery	
Summer 2015	-	-	-	-	-
Fall 2015	Highly Useful	Good	Highly Useful	Good	Good
Spring 2016	Useful	Good	Useful	Good	Adequate
Spring 2016	Highly Useful	Adequate	Highly Useful	Adequate	Adequate
Summer 2016	-	-	-	-	-
Fall 2016	Highly Useful	Adequate	Useful	Adequate	Adequate
Spring 2017	Highly Useful	Adequate	Highly Useful	Adequate	Deficient
Spring 2017	Highly Useful	Good	Useful	Good	Good

According to the survey by 84 students, the average overall outcome is 4.68 out of 5 and the average coverage adequacy is 4.40 out of 5, slightly higher than previous assessments.

SE I CEN 4010	# Responding	Overall Outcome	Coverage Adequacy
Summer 2015	18	4.40	4.34
Fall 2015	26	4.63	4.40
Spring 2016	23	4.77	4.34
Summer 2016	3	5.00	4.46
Fall 2016	9	4.49	4.01
Spring 2017	5	4.80	4.85
Total/Ave.	84	4.68	4.40

Instructors’ comments:

General:

- Team work continues to be a challenge for faculty – evaluation of individual contributions and navigating challenges of collaborative work
- Uniformity with regards to programming skill set

Prerequisites:

- There are concerns about the assessment tool not adequately reflecting all of the prerequisites for the course namely, COP4710, (CGS 3092 or CGS 3095)
- Faculty suggest the re-evaluation of the necessity of CNT4713 being a co-requisite to the course

Students' comments:

- Regarding the homework assignments and exams:
 - More in-class examples
 - Students express concern over the workload – normal course load (e.g., reading, homework, exams) compounded by semester-long project
- Regarding the syllabus and textbook:
 - The text is seldom used
 - Concerns regarding alignment between priorities in the class and grade distribution (i.e., working product is emphasized but only weighted as 20% of the course)
- Regarding the prerequisites:
 - Express concerns over preparedness; pre-requisites are not aligned with the expectations of the course (i.e., class project requiring web development knowledge)
- Regarding the lectures:
 - Would like more opportunities to practice the material presented in class (i.e., time in-class to work in teams on content presented in class)
- Regarding the projects:
 - More in-class group time
 - Appreciate the practical nature of the course
 - Would like more exposure to SCRUM or other agile methods

Observations and Recommendations:

- Observations:
 - The software engineering course is loaded with a great deal of material – software process, documentation, and an overarching project (that at times requires new acquired skillset); however, the explicit connection between the material and the end product is lost amongst what is perceived by students as a huge disconnect between the text, exams, and expectations.
 - Students and professors alike lack the understanding of the co-requisite Net-centric. Students believe it left them under-prepared, faculty think it is unnecessary. In either case, there exists an incongruence between the perceived goal of Net-centric and actual outcomes.
 - It appears as if students both appreciate and loathe the project; namely because they understand the value and practicality but are largely overwhelmed by the expectations – new technology, process, exams, and working product.
- Recommendations:
 - Evaluate the co-requisite of Net-Centric – is there misalignment between expectations of the course and outcomes or should it be removed as a co-requisite to the course

- In order to stay aligned with the expectations of the workforce, explore the transition to Agile software development process. Such a transition would: 1) alleviate some angst by students on how to manage and execute a working executable at the conclusion of the course while developing meaningful documentation; 2) provide insight to current work practices
- Professors of this course should adopt an Agile/Scrum book; suggested text: Ashmore, S., Runyan, K. (2015). Introduction to agile methods. Boston: Addison –Wesley.
- UML supplemental materials can be provided through the use of alternative media – YouTube, websites, manuals
- Class lecture times should be spent more on practicing Agile software engineering development rather than just giving lectures.
- Learning by example and practice is the best way to transfer the knowledge and experience from the professor to the students

CEN 4021 – Software Engineering II

- **Summary of Assessment:**

This course was taught three times the past two years. However, there were no assessments on file for this course.

SE II CEN 4021	Prerequisite						Student Preparedness
	CEN 4010 SE I						
	SW Life Cycle		Requirement Specification		Software Design & Implementation		
	Relevance	Mastery	Relevance	Mastery	Relevance	Mastery	
Fall 2015	-	-	-	-	-	-	-
Fall 2016	-	-	-	-	-	-	-
Spring 2017	-	-	-	-	-	-	-

According to the survey by 10 students, the average overall outcome is 4.68 out of 5 and the average coverage adequacy is 4.42 out of 5.

SE II CEN 4021	# Responding	Overall Outcome	Coverage Adequacy
Fall 2015	5	4.80	4.50
Fall 2016	4	4.25	4.25
Spring 2017	1	5.00	4.50
Year 2015-17	10	4.68	4.42

Instructors’ comments:

- None

Students’ comments:

- N/A

Observations and Recommendations:

- Emphasize the importance of instructor assessment of course
- No recommendations at this time

CEN 4072 – Software Testing & Verification

- **Summary of Assessment:**

This course was taught six times during the past two years. According to the instructor of this course, the relevancy of the prerequisites was rated as useful and the mastery of the students was rated as good. Students’ preparedness was indicated as adequate.

Testing CEN 4072	Prerequisite		Student Preparedness
	COP 3530 Data Structures		
	Data Structures		
	Relevance	Mastery	
Summer 2015	Useful	Good	Adequate
Fall 2015	Useful	Good	Adequate
Spring 2016	Useful	Good	Adequate
Summer 2016	Useful	Good	Adequate
Fall 2016	-	-	-
Spring 2017	Useful	Adequate	Adequate

According to the survey by 87 students, the average overall outcome is 4.44 out of 5 and the average coverage adequacy is 3.96 out of 5.

	# Responding	Overall Outcome	Coverage Adequacy
Summer 2015	8	4.55	3.82
Fall 2015	18	4.46	4.18
Spring 2016	4	4.75	4.64
Summer 2016	5	4.29	3.77
Fall 2016	14	4.74	4.69
Spring 2017	2	3.86	2.64
Year 2015-17	87	4.44	3.96

Instructors’ comments:

- The debugging topic needs to be removed from the list of objectives since there is not enough time to cover this topic. An updated syllabus was submitted to the undergraduate committee for review.
- The course should include testing mobile applications using automated tools in the near future.

- Students are lacking knowledge of some mathematical concepts that helps with test generation. For example, equivalent classes.

Students' comments:

- Regarding the homework assignments and exams:
 - Students lacked an understanding of the importance of documentation associated with testing design
- Regarding the syllabus and textbook:
 - Students noted lack of support resources for tools leveraged in the course
 - Students request additional software testing course to cover additional material in this domain
- Regarding the prerequisites:
 - Students expressed concern regarding Software Engineering not being a pre-requisite for this course. It was articulated that some of the skills acquired in software engineering are critical to success in this course
- Regarding the lectures:
 - Students indicated they would have appreciated more in-class time to practice concepts presented in the class where they could get feedback
- Regarding the projects:
 - Students were not able to make explicit connections between course content and project required in the course
 - Students requested access and exposure to more updated testing tools
- **Observations and Recommendations:**
 - Test-driven development is one of the popular agile software development practices in industry. Students should be exposed to this approach.
 - The lectures time should be spent more on practicing the testing methods using state-of-the-art tools.

CIS 4911 – Senior Project

- **Summary of Assessment:**

This course was taught six times during the past two years. According to the instructor of this course, the relevancy of the prerequisites was rated from useful to highly useful and mastery of the students was rated from deficient to adequate. Students' preparedness was indicated from deficient to adequate.

Senior Project CIS 4911	Prerequisite				Student Prepared ness
	CEN 4010 SE I				
	SW Dev. Process		Basic PM Concepts		
	Relevance	Mastery	Relevance	Mastery	
Summer 2015	Highly Useful	Deficient	Highly Useful	Deficient	Deficient
Fall 2015	Highly Useful	Adequate	Highly Useful	Deficient	Adequate

Spring 2016	Highly Useful	Adequate	Useful	Adequate	Adequate
Summer 2016	Highly Useful	Adequate	Useful	Adequate	Adequate
Fall 2016	Highly Useful	Adequate	Useful	Adequate	Adequate
Spring 2017	Highly Useful	Adequate	Useful	Adequate	Adequate

According to the survey by 125 students, the average overall outcome is 4.78 out of 5 and the average coverage adequacy is 4.57 out of 5.

Senior Project CIS 4911	# Responding	Overall Outcome	Coverage Adequacy
Summer 2015	1	5.00	5.00
Fall 2015	32	4.58	4.33
Spring 2016	26	4.69	4.41
Summer 2016	14	4.99	4.84
Fall 2016	26	4.66	4.35
Spring 2017	26	4.77	4.47
Year 2015-17	125	4.78	4.57

Instructors' comments:

- Many students lack the knowledge and application of software engineering, especially how to use UML diagrams properly.
- We practice Scrum, a popular agile software development approach, in our senior project, which is not being taught in CEN 4010. So, our students do not know how to develop software using this new agile method.

Students' comments:

- Preparation and Prerequisites:
 - Students suggest that more application development courses be offered (even as electives) prior to completion of senior project. Overwhelmingly, the comments reflect the sentiment that they feel woefully underprepared for large scale application development prior to this course (i.e., web application or mobile application development).
 - Students expressed the necessity of a software engineering course that directly aligns with senior project (i.e., if Agile is the expectation in senior project, then agile should be the process utilized in Software Engineering I)
- Software Development Process:
 - Students request that SCRUM be either incorporated in Software Engineering I or at least be reviewed in Senior Project
- Projects and Deliverables:
 - Students suggest more frequent feedback on deliverables to ensure they are meeting course expectations

- **Observations and Recommendations:**

- Software Engineering I, should be evaluated and perhaps redesigned to ensure that students (in all section offerings) have the same tools or resources necessary to be successful in Senior Project including:
 - Students should have a stronger understanding of UML diagrams and the appropriateness of different diagrams for portraying different aspects of a product
 - Students should learn how to be a productive team member in a self-organizing Agile/Scrum development team
 - Students should be proficient in Agile/Scrum software development process

IDS 4918 – VIP Program

- **Summary of Assessment:**

There are no assessments or course evaluations for this course at this time; therefore, there is no recommendation.

Subject Area: **Computer Systems** (Reported by Shu-Ching Chen)

Duration: Summer 2015 to Spring 2017

COP 4710 Database Management
CAP 4710 Principles of Computer Graphics
CAP 4770 Introduction to Data Mining
CEN 4083 Cloud Computing
COP 4604 Advanced UNIX Programming
COP 4722 Survey of Database Systems
CDA 4625 Intro to Mobile Robotics
CAP 4641 Intro to Natural Language Processing

COP 4710 Database Management

- *Appraisal and Course Evaluation Reports Status: This course was taught in twelve sessions of classes by four instructors during this period. The instructors have submitted all of the course appraisals for all the sessions. The student evaluation for all of the twelve 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.*
- *Recommendation: I recommend no changes to the outcome of this course.*
- *The following table shows a summary of the student evaluations:*

Semester	Session	# Responding	Outcome Value	Coverage Adequacy
Summer 2015	U01A	7	4.35	4.35
Fall 2015	RVC	4	5	5
Fall 2015	U01	24	4.77	4.55
Fall 2015	U02	5	4.97	3.71
Spring 2016	U01	16	4.75	4.69
Spring 2016	U02	7	4.9	4.92
Summer 2016	U01	3	4.1	3.9
Fall 2016	RVC	6	4.81	4.8
Fall 2016	U01	22	4.62	4.64
Fall 2016	U03	11	4.56	4.46
Spring 2017	U01	7	4.92	4.92
Spring 2017	U02	7	4.57	4.04

CAP 4710 Principles of Computer Graphics

- *Appraisal and Course Evaluation Reports Status: This course was taught two times by the same instructor during this period. The instructor did not submit the course appraisals for the session. The student evaluation for the session is available in the system.*
- *Summary of Assessment: This course has eight outcomes.*

- *Recommendation: I recommend no changes to the outcome of this course.*
- *The following table shows a summary of the student evaluations:*

Semester	Session	# Responding	Outcome Value	Coverage Adequacy
Spring 2016	U01	7	4.3	3.64
Spring 2017	U01	1	3.5	2.38

CAP 4770 Introduction to Data Mining

- *Appraisal and Course Evaluation Reports Status: This course was taught four times by two instructors during this period. The instructors did submit the course appraisal for this session. The student evaluation for this session is available in the system.*
- *Summary of Assessment: This course has six outcomes, all of which has been indicated by the instructors as either essential or appropriate.*
- *Recommendation: I recommend no changes to the outcome of this course.*
- *The following table shows a summary of the student evaluations:*

Semester	Session	# Responding	Outcome Value	Coverage Adequacy
Fall 2015	U01	16	4.74	4.71
Spring 2016	U01	6	4.31	3.71
Fall 2016	U01	22	4.63	4.21
Spring 2017	U01	5	4.3	4.3

CEN 4083 Cloud Computing

- *Appraisal and Course Evaluation Reports Status: This course was taught one time by one instructor during this period. The student evaluation for this session is available in the system. However, the instructor did not submit the course appraisal for this session.*
- *Summary of Assessment: This course has four outcomes.*
- *Recommendation: I recommend no changes to the outcome of this course.*
- *The following table shows a summary of the student evaluations:*

Semester	Session	# Responding	Outcome Value	Coverage Adequacy
Fall 2016	U01	6	4.88	4.75

COP 4604 Advanced Unix Programing

- *Appraisal and Course Evaluation Reports Status: This course was taught one time by one instructor during this period. The instructor didn't submit the course appraisal for this session. The student evaluation for this session is available in the system.*
- *Summary of Assessment: It is not available. No outcomes are specified.*
- *Recommendation: I recommend no changes to the outcome of this course.*

COP 4722 Survey of Database Systems

- *Appraisal and Course Evaluation Reports Status: This course was taught eleven times by two instructors during this period. The instructor has submitted all of the course appraisals for all the sessions. The student evaluation for all of the four sessions is available in the system.*
- *Summary of Assessment: This course has five outcomes, all of which has been indicated by the instructors as either essential or appropriate. However, the objective “Object-Oriented Database” and “Spatial and Multimedia Databases” have once indicated as inappropriate by the instructor.*
- *Recommendation: I recommend no changes to the outcome of this course.*
- *The following table shows a summary of the student evaluations:*

Semester	Session	# Responding	Outcome Value	Coverage Adequacy
Summer 2015	U02A	10	4.66	4.38
Summer 2015	U01	22	4.37	4.31
Summer 2015	U02	6	4.62	4.41
Spring 2016	U01	9	4.51	4.5
Spring 2016	U02	15	4.49	4.3
Summer 2016	U02A	12	4.55	4.43
Fall 2016	RVC	3	4.73	4
Fall 2016	UHA	18	4.76	4.5
Spring 2017	RVC	6	4.37	4.55
Spring 2017	UHA	3	4.6	4.4
Spring 2017	UHB	3	4.6	4.13

CDA 4625 Intro to Mobile Robotics

- *Appraisal and Course Evaluation Reports Status: This course was taught once by one instructor during this period. The instructor did not submit the course appraisals for the session. The student evaluation for the session is available in the system.*
- *Summary of Assessment: This course has no outcomes set up yet.*
- *Recommendation: I recommend no changes to the outcome of this course.*

CDA 4641 Intro to Natural Language Processing

- *Appraisal and Course Evaluation Reports Status: This course was taught once by one instructor during this period. The instructor has submitted the course appraisals for both two sessions. The student evaluation for the session is available in the system.*
- *Summary of Assessment: This course has four outcomes, all of which has been indicated by the instructors as essential.*
- *Recommendation: I recommend no changes to the outcome of this course.*

APPENDIX D-1: Exit (Graduating Student) Survey

Raw Data and Statistics for Individual Semesters

The raw data for individual semesters are presented here along with statistical calculations. The aggregate data for five semesters from Summer 2015 to Spring 2017 (Summer 2016 data was not collected) along with aggregate statistical results are included below.

			SUMMER 2015 GRADUATING STUDENT (EXIT) SURVEY - STATISTICS								
								TOT AL	NUM BER OF	AVE RAG E	
PROGRAM EDUCATIONAL OBJECTIVE			SCORES - # OF STUDENTS RESPONDING				WEI GHT ED	RES P ONS ES	SCO RE		
			Ag ree	Agree	Agree	Disag ree	Disag ree	Disag ree	SCO RE		
			Stro ngly	Moder ately	Some what	Some what	Mode rative ly	Stron gly			
			5	4	3	2	1	0			
Proficiency in Foundation Areas of Computer Science											
Outcome has been met for me personally			20	6	0	0	0	0	124	26	4.77
How meaningful the outcome is for me personally			23	2	0	0	1	0	124	26	4.77
Proficiency in Core Areas of Computer Science											
Outcome has been met for me personally			22	2	1	1	0	0	123	26	4.73
How meaningful the outcome is for me personally			24	1	1	0	0	0	127	26	4.88
Proficiency in Problem Solving											
Outcome has been met for me personally			19	3	3	1	0	0	118	26	4.54

How meaningful the outcome is for me personally	23	3	0	0	0	0	127	26	4.88
Proficiency in Programming Language									
Outcome has been met for me personally	21	2	3	0	0	0	122	26	4.69
How meaningful the outcome is for me personally	25	1	0	0	0	0	129	26	4.96
Understanding of Social and Ethical Issues									
Outcome has been met for me personally	17	5	4	0	0	0	117	26	4.50
How meaningful the outcome is for me personally	17	6	2	0	0	1	115	26	4.42
Ability to Work Cooperatively in Teams									
Outcome has been met for me personally	19	4	3	0	0	0	120	26	4.62
How meaningful the outcome is for me personally	21	5	0	0	0	0	125	26	4.81
Demonstrate Effective Communication Skills									
Outcome has been met for me personally	17	6	3	0	0	0	118	26	4.54
How meaningful the outcome is for me personally	20	5	1	0	0	0	123	26	4.73
Experience with Contemporary Environments and Tools									
Outcome has been met for me personally	16	5	3	1	1	0	112	26	4.31
How meaningful the outcome is for me personally	21	4	1	0	0	0	124	26	4.77

			FALL 2015 GRADUATING STUDENT (EXIT) SURVEY - STATISTICS								
									TOT AL	NUM BER OF	AVE RAG E
PROGRAM EDUCATIONAL OBJECTIVE			SCORES - # OF STUDENTS RESPONDING				WEI GHT ED	RES P ONS ES	SCO RE		
			Ag ree	Agree	Agree	Disag ree	Disag ree	Disag ree	SCO RE		
			Stro ngly	Moder ately	Some what	Some what	Mode rative ly	Stron gly			
			5	4	3	2	1	0			
Proficiency in Foundation Areas of Computer Science											
Outcome has been met for me personally			20	8	5	0	0	0	147	33	4.45
How meaningful the outcome is for me personally			21	8	3	0	1	0	147	33	4.45
Proficiency in Core Areas of Computer Science											
Outcome has been met for me personally			17	11	4	1	0	0	143	33	4.33
How meaningful the outcome is for me personally			24	6	2	1	0	0	152	33	4.61
Proficiency in Problem Solving											
Outcome has been met for me personally			20	6	7	0	0	0	145	33	4.39
How meaningful the outcome is for me personally			24	5	3	1	0	0	151	33	4.58

Proficiency in Programming Language									
Outcome has been met for me personally	20	8	4	1	0	0	146	33	4.42
How meaningful the outcome is for me personally	24	6	2	1	0	0	152	33	4.61
Understanding of Social and Ethical Issues									
Outcome has been met for me personally	16	8	6	1	2	0	134	33	4.06
How meaningful the outcome is for me personally	17	8	4	1	2	1	133	33	4.03
Ability to Work Cooperatively in Teams									
Outcome has been met for me personally	19	9	2	0	1	2	138	33	4.18
How meaningful the outcome is for me personally	22	9	1	1	0	0	151	33	4.58
Demonstrate Effective Communication Skills									
Outcome has been met for me personally	17	9	5	2	0	0	140	33	4.24
How meaningful the outcome is for me personally	21	9	3	0	0	0	150	33	4.55
Experience with Contemporary Environments and Tools									
Outcome has been met for me personally	16	11	3	2	0	1	137	33	4.15
How meaningful the outcome is for me personally	22	10	1	0	0	0	153	33	4.64

			SPRING 2016 GRADUATING STUDENT (EXIT) SURVEY - STATISTICS								
									TOT AL	NUM BER OF	AVE RAG E
PROGRAM EDUCATIONAL OBJECTIVE			SCORES - # OF STUDENTS RESPONDING				WEI GHT ED	RES P ONS ES	SCO RE		
			Ag ree	Agree	Agree	Disag ree	Disag ree	Disag ree	SCO RE		
			Stro ngly	Moder ately	Some what	Some what	Mode rative ly	Stron gly			
			5	4	3	2	1	0			
Proficiency in Foundation Areas of Computer Science											
Outcome has been met for me personally			20	10	2	1	0	0	148	33	4.48
How meaningful the outcome is for me personally			23	7	2	1	0	0	151	33	4.58
Proficiency in Core Areas of Computer Science											
Outcome has been met for me personally			18	9	4	1	0	1	140	33	4.24
How meaningful the outcome is for me personally			25	4	3	0	0	0	150	32	4.69
Proficiency in Problem Solving											
Outcome has been met for me personally			19	5	6	1	1	0	136	32	4.25
How meaningful the outcome is for me personally			24	5	3	0	0	0	149	32	4.66

Proficiency in Programming Language									
Outcome has been met for me personally	24	5	3	0	0	0	149	32	4.66
How meaningful the outcome is for me personally	26	5	1	0	0	0	153	32	4.78
Understanding of Social and Ethical Issues									
Outcome has been met for me personally	20	5	5	0	1	1	136	32	4.25
How meaningful the outcome is for me personally	19	5	3	1	2	2	128	32	4.00
Ability to Work Cooperatively in Teams									
Outcome has been met for me personally	21	4	6	1	0	0	141	32	4.41
How meaningful the outcome is for me personally	24	5	2	0	0	0	146	31	4.71
Demonstrate Effective Communication Skills									
Outcome has been met for me personally	18	6	3	4	0	0	131	31	4.23
How meaningful the outcome is for me personally	23	7	1	0	0	0	146	31	4.71
Experience with Contemporary Environments and Tools									
Outcome has been met for me personally	19	3	4	1	2	2	123	31	3.97
How meaningful the outcome is for me personally	24	3	3	1	0	0	143	31	4.61

			FALL 2016 GRADUATING STUDENT (EXIT) SURVEY - STATISTICS								
									TOT AL	NUM BER OF	AVE RAG E
PROGRAM EDUCATIONAL OBJECTIVE			SCORES - # OF STUDENTS RESPONDING					WEI GHT ED	RESP ONS ES	SCO RE	
			Ag ree	Agree	Agree	Disag ree	Disag ree	Disag ree	SCO RE		
			Stro ngly	Moder ately	Some what	Some what	Mode rative ly	Stron gly			
			5	4	3	2	1	0			
Proficiency in Foundation Areas of Computer Science											
Outcome has been met for me personally			15	4	1	1	0	0	96	21	4.57
How meaningful the outcome is for me personally			11	7	3	0	0	0	92	21	4.38
Proficiency in Core Areas of Computer Science											
Outcome has been met for me personally			15	6	0	0	0	0	99	21	4.71
How meaningful the outcome is for me personally			17	4	0	0	0	0	101	21	4.81
Proficiency in Problem Solving											
Outcome has been met for me personally			10	8	2	0	1	0	89	21	4.24
How meaningful the outcome is for me personally			17	4	0	0	0	0	101	21	4.81

Proficiency in Programming Language									
Outcome has been met for me personally	13	2	4	1	0	1	87	21	4.14
How meaningful the outcome is for me personally	16	3	2	0	0	0	98	21	4.67
Understanding of Social and Ethical Issues									
Outcome has been met for me personally	9	6	4	1	1	0	84	21	4.00
How meaningful the outcome is for me personally	14	4	3	0	0	0	95	21	4.52
Ability to Work Cooperatively in Teams									
Outcome has been met for me personally	8	8	4	0	0	1	84	21	4.00
How meaningful the outcome is for me personally	14	3	3	1	0	0	93	21	4.43
Demonstrate Effective Communication Skills									
Outcome has been met for me personally	4	11	4	1	0	1	78	21	3.71
How meaningful the outcome is for me personally	11	6	4	0	0	0	91	21	4.33
Experience with Contemporary Environments and Tools									
Outcome has been met for me personally	7	4	7	0	2	1	74	21	3.52
How meaningful the outcome is for me personally	13	6	1	1	0	0	94	21	4.48

			SPRING 2017 GRADUATING STUDENT (EXIT) SURVEY - STATISTICS								
									TOT AL	NUM BER OF	AVE RAG E
PROGRAM EDUCATIONAL OBJECTIVE			SCORES - # OF STUDENTS RESPONDING				WEI GHT ED	RES P ONS ES	SCO RE		
			Ag ree	Agree	Agree	Disag ree	Disag ree	Disag ree	SCO RE		
			Stro ngly	Moder ately	Some what	Some what	Mode rative ly	Stron gly			
			5	4	3	2	1	0			
Proficiency in Foundation Areas of Computer Science											
Outcome has been met for me personally			9	4	1	0	0	0	64	14	4.57
How meaningful the outcome is for me personally			9	3	2	0	0	0	63	14	4.50
Proficiency in Core Areas of Computer Science											
Outcome has been met for me personally			9	5	0	0	0	0	65	14	4.64
How meaningful the outcome is for me personally			12	1	1	0	0	0	67	14	4.79
Proficiency in Problem Solving											
Outcome has been met for me personally			10	4	0	0	0	0	66	14	4.71
How meaningful the outcome is for me personally			14	0	0	0	0	0	70	14	5.00

Proficiency in Programming Language									
Outcome has been met for me personally	9	3	0	2	0	0	61	14	4.36
How meaningful the outcome is for me personally	14	0	0	0	0	0	70	14	5.00
Understanding of Social and Ethical Issues									
Outcome has been met for me personally	6	3	4	0	1	0	55	14	3.93
How meaningful the outcome is for me personally	7	3	2	1	1	0	56	14	4.00
Ability to Work Cooperatively in Teams									
Outcome has been met for me personally	11	1	2	0	0	0	65	14	4.64
How meaningful the outcome is for me personally	9	4	1	0	0	0	64	14	4.57
Demonstrate Effective Communication Skills									
Outcome has been met for me personally	8	3	2	1	0	0	60	14	4.29
How meaningful the outcome is for me personally	8	4	2	0	0	0	62	14	4.43
Experience with Contemporary Environments and Tools									
Outcome has been met for me personally	7	4	2	0	1	0	58	14	4.14
How meaningful the outcome is for me personally	8	6	0	0	0	0	64	14	4.57

APPENDIX D-2: Exit (Graduating Student) Survey
SUMMARY OF STATISTICAL RESULTS - SUMMER 2015 TO SPRING 2017

TOTAL RESPONSES → 127

PROGRAM EDUCATIONAL OUTCOME			TOTAL RESPONSES	FINAL SCORE (WEIGHTED)	PERCENTAGE
A - Proficiency in Foundation Areas of Computer Science					
Outcome has been met for me personally			127	4.56	91.13
How meaningful the outcome is for me personally			127	4.54	90.86
B - Proficiency in Core Areas of Computer Science					
Outcome has been met for me personally			127	4.49	89.71
How meaningful the outcome is for me personally			126	4.74	94.79
C - Proficiency in Problem Solving					
Outcome has been met for me personally			126	4.40	87.92
How meaningful the outcome is for me personally			126	4.75	94.94
D - Proficiency in Programming Language					
Outcome has been met for me personally			126	4.48	89.67
How meaningful the outcome is for me personally			126	4.78	95.57
E - Understanding of Social and Ethical Issues					
Outcome has been met for me personally			126	4.17	83.49
How meaningful the outcome is for me personally			126	4.18	83.62
F - Ability to Work Cooperatively in Teams					
Outcome has been met for me personally			126	4.35	87.01

How meaningful the outcome is for me personally	125	4.63	92.68
G - Demonstrate Effective Communication Skills			
Outcome has been met for me personally	125	4.22	84.33
How meaningful the outcome is for me personally	125	4.58	91.53
H - Experience with Contemporary Environments and Tools			
Outcome has been met for me personally	125	4.03	80.63
How meaningful the outcome is for me personally	125	4.62	92.50
AVERAGE RATING OF STUDENT OUTCOMES - 'A' TO 'H'			
	ATTAINMENT	4.34	86.75
	RELEVANCE	4.60	92.06
AVERAGE RATING OF STUDENT OUTCOMES - 'A' TO 'E'			
	ATTAINMENT	4.42	88.39
	RELEVANCE	4.60	91.96

APPENDIX E-1: Alumni Survey - Raw Data and Statistics

The Alumni Survey data for this cycle was collected between May 2017 and October 2017. It is presented below along with statistical results.

ALUMNI SURVEY - STATISTICS - 2017							TOTAL	NUMBER OF	AVERAGE		
PROGRAM EDUCATIONAL OBJECTIVE				SCORES - # OF STUDENTS RESPONDING			WEIGHTED	RESPONSES	SCORE	PERCENTAGE	
				Excellent	Good	Satisfactory	Poor	Unsatisfactory	SCORE		
				4	3	2	1	0			
EDUCATIONAL EXPERIENCE											
Capacity for Personal growth				80	61	22	3	3	550	169	3.25 81.36
Capacity for Lifelong learning				81	65	19	3	1	560	169	3.31 82.84
Development of Communication Skills				57	66	40	4	1	510	168	3.04 75.89
Awareness of Social & Ethical Responsibility				53	65	44	4	3	499	169	2.95 73.82
Preparation for career in CS				66	49	37	12	5	497	169	2.94 73.52
Preparation for Graduate Study				58	59	40	6	5	495	168	2.95 73.66
PREPARATION UPON GRADUATION											
Quality of Preparation - Computer programming				68	58	25	7	1	503	159	3.16 79.09
Quality of Preparation - Systems Development				46	62	41	7	3	459	159	2.89 72.17
Quality of Preparation - Data Structures & Algo.				76	48	24	8	1	504	157	3.21 80.25
Quality of Preparation - Comp. Architecture & Org.				53	63	30	10	3	471	159	2.96 74.06
FACULTY AND INSTRUCTION											
Dedication of Faculty to UG Teaching				74	61	25	5	4	534	169	3.16 78.99
Expertise of Faculty in Subject Areas				81	64	15	5	1	551	166	3.32 82.98
Mentorship provided by Faculty				42	56	44	9	3	443	164	2.70 67.53
Overall Instructional Capability of Faculty				62	73	24	6	1	521	166	3.14 78.46
DIVERSITY PROMOTION AND ENVIRONMENT											
Effectiveness in maintaining diverse student body				81	52	17	6	0	520	156	3.33 83.33
Diversity as agent for personal growth				74	60	26	3	3	531	166	3.20 79.97
Diversity as agent for awareness of social concerns				50	66	34	3	2	469	155	3.03 75.65
Extent to which healthy learning env. Is promoted				69	65	19	4	0	513	157	3.27 81.69

OVERALL RATING OF EDUCATIONAL EXPERIENCE	395	365	202	3 2	18	3111	1012	3.07	76.85	
OVERALL RATING OF PREPARATION UPON GRADUATION	243	231	120	3 2	8	1937	634	3.06	76.38	
OVERALL RATING OF FACULTY & INSTRUCTION	259	254	108	3 5	9	2049	665	3.08	77.03	
OVERALL RATING OF DIVERSITY PROMOTION & ENV.	274	243	96	1 6	5	2033	634	3.21	80.17	
OVERALL SATISFACTION WITH BS-CS PROG. OBJECTIVES	117 1	109 3	526	1 1 5	40	9130	2945	3.10	77.50	

**APPENDIX E-2: Employer Survey Instrument
FLORIDA INTERNATIONAL UNIVERSITY
SCHOOL OF COMPUTER SCIENCE
(CONFIDENTIAL) EMPLOYER EVALUATION**

To: The Evaluator

The School of Computer Science at Florida International University seeks your confidential opinion about our graduates and your employees, with the goal of using this information to help us assess the effectiveness of our program in preparing our students to enter the work-place. Please rest assured that your opinions will be used only to strengthen our programs and not for any other purpose. We urge you to complete this survey based on the performance of all, or most of our graduates employed by your company. Thank you for your participation.

Part-A:

Your Name:

Your Position:

Company Name:

Office Address:

Office Phone:

E-mail:

Part-B:

Please rate the following skills of our graduates: {Choices: Outstanding, Excellent, Good, Fair, Poor, Unable to Comment}

- 1) Ability to communicate orally
- 2) Ability to communicate in written form
- 3) Ability to work cooperatively in a team
- 4) Understanding of the social and ethical concerns of practicing computer scientist
- 5) Mastery of the fundamental computer science concepts and ability to solve computing problems using them

APPENDIX E-3: Employer Survey Raw Data and Statistics

The Employer Survey data for this cycle was collected between May 2017 and November 2017. It is presented below along with statistical results.

TOTAL RESPONSES → 22 (No more than 11 for any question)

		EMPLOYER SURVEY 2015-2017								
		EMPLOYER RESPONSES								
SCIS Prog.	SCIS Prog.	Question about our Graduates	Excellent	Very Good	Good	Fair	Poor	Total	Weighted	
Objective	Objective								Score	
Pre-Fall 2015	Post-Fall 2015									
		Response Score - ->	4	3	2	1	0		Max. = 4	
2	2.1	Mastery of CS concepts & ability to solve problems	4	4	1	1	0	10	3.10	
3	2.2	Ability to Communicate Verbally	5	2	3	0	1	11	2.91	
3	2.2	Ability to Communicate in Written Form	3	1	5	1	1	11	2.36	
4	2.2	Ability to work cooperatively in a team	6	3	0	0	1	10	3.30	
3	2.3	Understanding of Social and Ethical Concerns	4	3	2	0	1	10	2.90	
1	2.4	Ability to learn Emerging Concepts and Technologies	5	3	2	0	1	11	3.00	
4	1	Will you consider employing our graduates in future	Yes = 10	No = 1				63		
		OVERALL SCORE OF OUR GRADUATES	2.92							

APPENDIX F: Course-Embedded Assessment Summaries
Fall 2015 and Fall 2016

DIRECT ASSESSMENT SUMMARY OF CS COURSES (SENIOR PROJECT EXCLUDED) - FALL 2015 - FALL 2016						
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CEN 4010	Software Engineering	10	5	23.81	23.81
		Project Documentation	9	11	52.38	76.19
			8	5	23.81	100.00
			TOTAL-->	21		
					75% cut-off --> (7.5)	100.00
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CGS 3095	Professional Development	4	43	68.25	68.25
		Social & Ethical Concerns	3	10	15.87	84.13
			2	4	6.35	90.48
			1	6	9.52	100.00
			0	0	0.00	100.00
			TOTAL -->	63		
					75% cut-off --> (3)	84.13
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CGS 3095	Professional Development	4	46	73.02	73.02
		Communication Skills	3	4	6.35	79.37
			2	6	9.52	88.89
			1	7	11.11	100.00
			0	0	0.00	100.00
			TOTAL -->	63		

				75% cut-off --> (3)	79.37	
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CGS 3095	Professional Development	4	39	61.90	61.90
		Legal, ethical, and social impacts	3	16	25.40	87.30
		of technology as related to	2	0	0.00	87.30
		individual privacy, security, and	1	5	7.94	95.24
		anonymity in societies across	0	3	4.76	100.00
		the globe and in the global				
		internet society	TOTAL -->	63		
				75% cut-off --> (3)	87.30	
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CGS 3095	Professional Development	4	43	68.25	68.25
		Legal, ethical, and social impacts	3	10	15.87	84.13
		of technology as related to	2	4	6.35	90.48
		intellectual property rights, and	1	6	9.52	100.00
		how the global reach of the	0	0	0.00	100.00
		internet effects these issues				
			TOTAL -->	63		
				75% cut-off --> (3)	84.13	
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	CGS 3095	Professional Development	4	54	85.71	85.71
		Computing Professional's Roles	3	0	0.00	85.71
		and Responsibilities as related to	2	0	0.00	85.71
		intellectual property, privacy,	1	0	0.00	85.71
		anonymity, legal, social, and	0	9	14.29	100.00
		ethical issues				
			TOTAL -->	63		
				75% cut-off --> (3)	85.71	

SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3337	Programming	8	13	36.11	36.11
		Inheritance & Polymorphism	7	8	22.22	58.33
			6	7	19.44	77.78
			5	4	11.11	88.89
			4	1	2.78	91.67
			3	1	2.78	94.44
			0	2	5.56	100.00
			TOTAL-->	36		
					75% cut-off -> (6)	77.78
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3337	Programming	8	21	58.33	58.33
		Exceptions	7	6	16.67	75.00
			6	4	11.11	86.11
			5	4	11.11	97.22
			0	1	2.78	100.00
			TOTAL-->	36		
					75% cut-off -> (6)	86.11
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3530	Programming	16	1	3.125	3.125
		Data Structures & Analysis of Algo.	15.5	2	6.25	9.375
			15	2	6.25	15.625
			14.5	2	6.25	21.875
			14	1	3.125	25
			13.5	1	3.125	28.125
			13	3	9.375	37.5
			12.5	3	9.375	46.875

			12	3	9.375	56.25
			11.5	4	12.5	68.75
			11	1	3.125	71.875
			10.5	5	15.625	87.5
			8.5	2	6.25	93.75
			8	2	6.25	100
			Total -->	32		
					75% cut-off -> (12)	56.25
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3530	Programming	8	13	39.39	39.39
		Abstraction	7	9	27.27	66.67
			6	4	12.12	78.79
			5	4	12.12	90.91
			4	3	9.09	100.00
			Total -->	33		
					75% cut-off -> (6)	78.79
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3530	Programming	12	12	36.36	36.36
		Use of Java API	11	9	27.27	63.64
			10	3	9.09	72.73
			9	7	21.21	93.94
			8	1	3.03	96.97
			6	1	3.03	100.00
			Total -->	33		
					75% cut-off -> (9)	93.94
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				

Fall 2015	COP 3530	Programming	8	9	29.03	29.03
		Linked Structures	7	3	9.68	38.71
			6	6	19.35	58.06
			5	7	22.58	80.65
			4	3	9.68	90.32
			2	3	9.68	100.00
			Total -->	31		
					75% cut-off -> (6)	58.06
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 3530	Programming	8	30	90.91	90.91
		Recursion	0	3	9.09	100.00
			Total -->	33		
					75% cut-off -> (6)	90.91
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 4338	Computer Systems	8	9	64.29	64.29
		Computer Systems - Processes	7	2	14.29	78.57
			5	1	7.14	85.71
			4	1	7.14	92.86
			3	1	7.14	100.00
			Total -->	14		
					75% cut-off --> (6)	78.57
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 4338	Computer Systems	12	3	23.08	23.08
		C Language Proficiency	11	4	30.77	53.85

			10	1	7.69	61.54
			7	3	23.08	84.62
			6	2	15.38	100.00
			Total -->	13		
					75% cut-off --> (9)	61.54
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 4555	Foundations	10	7	21.21	21.21
		Survey of Programming Languages	9	2	6.06	27.27
			8	5	15.15	42.42
			7	4	12.12	54.55
			6	5	15.15	69.70
			5	3	9.09	78.79
			4	4	12.12	90.91
			3	1	3.03	93.94
			2	2	6.06	100.00
			Total -->	33		
					75% cut-off --> (7.5)	42.42
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION				
Fall 2016	COP 4610	Computer Systems	12	1	1.69	1.69
		Memory Management	11	16	27.12	28.81
			10	25	42.37	71.19
			9	7	11.86	83.05
			8	5	8.47	91.53
			7	2	3.39	94.92
			6	2	3.39	98.31
			5	1	1.69	100.00
			Total -->	59		
					75% cut-off --> (9)	83.05

SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulative
	NUMBER	TOPIC DESCRIPTION				
Fall 2016	COP 4610	Computer Systems	12	2	3.57	3.57
		Storage Management	11	12	21.43	25.00
			10	12	21.43	46.43
			9	6	10.71	57.14
			8	10	17.86	75.00
			7	9	16.07	91.07
			6	5	8.93	100.00
			Total -->	56		
					75% cut-off --> (9)	57.14
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulative
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	COP 4710	Computer Systems	15	3	10.34	10.34
		Database Management	14	3	10.34	20.69
			13	5	17.24	37.93
			12	8	27.59	65.52
			11	1	3.45	68.97
			10	3	10.34	79.31
			9	4	13.79	93.10
			8	1	3.45	96.55
			7	1	3.45	100.00
			Total -->	29		
					75% cut-off --> (11.25)	65.52
SEMESTER	COURSE	PROGRAM OBJECTIVE	Score	# Students	%	Cumulative
	NUMBER	TOPIC DESCRIPTION				
Fall 2015	MAD 2104	Foundations	16	4	14.29	14.29
		Discrete Structures and Logic	15	4	14.29	28.57
			13	3	10.71	39.29
			12	4	14.29	53.57
			11	2	7.14	60.71

				10	1	3.57	64.29
				9	4	14.29	78.57
				8	1	3.57	82.14
				6	1	3.57	85.71
				4	2	7.14	92.86
				3	1	3.57	96.43
				1	1	3.57	100.00
				TOTAL-->	28		
						75% cut-off --> (12)	53.57
SEMESTER	COURSE	PROGRAM OBJECTIVE		Score	# Students	%	Cumulativ e
	NUMBER	TOPIC DESCRIPTION					
Fall 2016	MAD 3512	Foundations		9	2	13.33	13.33
		Theory of Algorithms		8	7	46.67	60.00
				7	2	13.33	73.33
				6	3	20.00	93.33
				3	1	6.67	100.00
				TOTAL-->	15		
						75% cut-off --> (6.75)	73.33

APPENDIX G-1: Senior Project Assessment Instruments

Rating-Sheet

Senior Project

Assessment of Student Outcomes of the BS in Computer Science of the FIU School of Computing and Information Sciences

Project Title: «Title1»

Number of team members: «Team Members» Semester & Year: «Semester»

Project origination: «Origination»

Evaluator

Affiliation

«Evaluator»

«Evaluator Affiliation»

=====

Your responses to this survey instrument will be used solely for the purpose of assessing the Student Outcomes of the BS in Computer Science program of the School of Computing and Information Sciences at FIU. The survey is expressly NOT for assessment of student performance in the SCIS Senior Project course, nor for assessment of the instructor(s).

For each Student Outcome, decide whether this project provides sufficient evidence to make a judgment about the students' attainment of that Student Outcome. If so, please indicate your assessment of the level of attainment of that Student Outcome demonstrated in this project:

Rating	Criterion
n/a	The project does not provide clear evidence about this particular outcome
1	The project demonstrates poor attainment of this outcome
2	The project demonstrates fair attainment of this outcome
3	The project demonstrates good attainment of this outcome
4	The project demonstrates very good attainment of this outcome
5	The project demonstrates excellent attainment of this outcome

BS in CS Student Outcomes Assessment via Senior Project

Student Outcomes	Rating
a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.	«a»
b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.	«b»
c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.	«c»
d) An ability to function effectively on teams to accomplish a common goal.	«d»
e) An understanding of professional, ethical, legal, security and social issues and responsibilities.	«e»
f) An ability to communicate effectively with a range of audiences.	«f»
g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.	«g»
h) Recognition of the need for and an ability to engage in continuing professional development.	«h»
i) An ability to use current techniques, skills, and tools necessary for computing practice.	«i»
j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.	«j»
k) An ability to apply design and development principles in the construction of software systems of varying complexity.	«k»

Rubric («Semester»)

Senior Project

**Assessment of Student Outcomes of the BS in Computer Science
of the
School of Computing and Information Sciences
Florida International University**

The School of Computing and Information Sciences evaluates the Senior Projects of its graduating seniors for the purpose of assessing the level of attainment of the Student Outcomes of the BS in Computer Science program.

Your responses to this survey will be used solely for the purpose of assessing the Student Outcomes of the BS in Computer Science program of the School of Computing and Information Sciences at FIU. This survey is expressly NOT for assessment of student performance in the SCIS Senior Project course for assignment of letter grade, nor for assessment of the instructor(s).

Rating Instructions

For each program outcome standard, you are provided with a check-list of 7 or more criteria that evidence attainment of that standard. Please check all criteria that are represented in this project. You may include additional criteria that are not explicitly listed; if so, please record the additional criteria in the appropriate sections. Unless noted otherwise, the number of checked criteria in each section, up to a maximum of 5, will be recorded as your rating of attainment of that outcome standard evidenced in the project.

Project Title: «**Title1**»

Semester & Year: «**Semester**»

Moderator (Faculty / Industry Sponsor): «**Moderator**»

Evaluators: «**Evaluator**»

Student Outcome (a): *An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.*



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«a1» Students used math expressions in their project.

«a2» Students used logical expressions in their project.

«a3» Students used statistics to characterize and interpret data in their project.

«a4» Students used models to solve problems in their project.

«a5» Students performed data analysis in their project.

«a6» Students developed mathematical algorithms in their project.

«a7» Students analyzed complexity and efficiency in their project.

«a8» Students developed model for some processes in their project.

«a9» Students used formal verification and formal proofs in their project.

Student Outcome (b): *An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.*



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«b1» Students casted a real-world problem to a computing problem in their project.

«b2» Students modified problem definition as new information arrived in their project.

«b3» Students elicited requirement from users in their project.

«b4» Students developed requirements specifications in their project.

«b5» Students conducted feasibility studies in their project.

«b6» Students formulated solution strategies in their project.

«b7» Students estimated resources required for their proposed solution.

«b8» Students evaluated the space, time, and financial demands of their solution.

«b9» Students mapped identified appropriate languages, platforms, and hardware in their project.

Student Outcome (c): *An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.*



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«c1» Students applied software engineering principles to produce their solution to the problem in their project.

«c2» Students considered alternatives technologies and development methodologies in their project.

«c3» Students developed design documents in their project.

«c4» Students used two or more high level languages in their project.

«c5» Students developed metrics for testing and verifying their solution in their project.

«c6» Students created a set of tests and use them to verify their solution.

«c7» Students measured system performance and quality of service in their project.

Student Outcome (d): *An ability to function effectively on teams to accomplish a common goal.*



Enter **n/a** if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

To be completed by an evaluator

«d1» All team members contributed equally to the project.

«d2» All team members activities were appropriately and adequately documented.

To be completed from the data obtained from team members' peer evaluations

Each team member rates each of the other members of their team individually on each criterion listed below on a scale of 1 to 5. The mean of all ratings for each criterion is recorded.

The rubric item is checked only if the project (mean) score ≥ 4.0 for each of the 2 criteria.

«d3» Team members' roles were clearly defined and executed

<u>Criterion</u>	<u>Mean Score</u>
1: <i>Team members had clear understanding of expectations.</i>	«d31»
2: <i>Team members maximized the use of their individual skill sets.</i>	«d32»

«d4» Project team set out and followed a schedule for timely completion

<u>Criterion</u>	<u>Mean Score</u>
3: <i>Team members complied with mechanisms to track progress.</i>	«d41»
4: <i>Team members completed assignments in a timely fashion.</i>	«d42»

«d5» Project team negotiated consensus when needed

<u>Criterion</u>	<u>Mean Score</u>
5: <i>Team members showed respect for other team members opinions.</i>	«d51»
6: <i>Team members were able to negotiate and compromise.</i>	«d52»

«d6» Project completion evidences equitable participation by team members

<u>Criterion</u>	<u>Mean Score</u>
7: <i>Team members contributed ideas and viewpoints.</i>	«d61»
8: <i>Team members did their fair share of the work.</i>	«d62»

«d7» Team members shared responsibility for success and failure

<u>Criterion</u>	<u>Mean Score</u>
9: <i>Team members actively sought & shared information from each other.</i>	«d71»
10: <i>Team members were adaptable to changing requirements.</i>	«d72»

Student Outcome (e): An understanding of professional, ethical, legal, security and social issues and responsibilities.



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«e1» Students demonstrated understanding of intellectual property issues in their project.

«e2» Students demonstrated working knowledge of a code of ethics in their project.

«e3» Students recognized situations where discrimination arose in their project.

«e4» Students demonstrated proper etiquette and proactive social behavior in professional situations in their project.

«e5» Students suggested remedies for specific situations which create a hostile work environment in their project.

«e6» Students properly cited documents sources and references in their project.

«e7» Students identified and addressed some relevant legal issues in their project.

«e8» Students identified and addressed some relevant privacy issues in their project.

«e9» Students identified and addressed some relevant security issues in their project.

Program Outcome (f): *An ability to communicate effectively with a range of audiences.*



Enter **n/a** if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

Written presentation

«f1» Completeness Students documented all essential project features.

«f2» Organization Students provided a well-organized final document.

Oral Presentation

- 1) Rate each presenter individually using the oral presentation rubric provided
- 2) Record the presenters' ratings of each presenter in each rubric item
- 3) Calculate the mean presenter rating for each rubric item
- 4) **For each rubric item, check only if the mean score ≥ 3.0**

«f3» Domain Knowledge:

Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	Mean
«f31»	«f32»	«f33»	«f34»	«f35»	«f36»

«f4» Organization:

Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	Mean
«f41»	«f42»	«f43»	«f44»	«f45»	«f46»

«f5» Presentation Aids:

Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	Mean
«f51»	«f52»	«f53»	«f54»	«f55»	«f56»

«f6» Elocution:

Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	Mean
«f61»	«f62»	«f63»	«f64»	«f65»	«f66»

«f7» Audience Contact:

Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	Mean
«f71»	«f72»	«f73»	«f74»	«f75»	«f76»

Student Outcome (g): *An ability to analyze the local and global impact of computing on individuals, organizations, and society.*

«g»

Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«g1» Students demonstrated understanding of various ways in which computing technology impacts individuals in their project.

«g2» Students demonstrated understanding of various ways in which computing technology impacts organizations in their project.

«g3» Students demonstrated understanding of various ways in which computing technology impacts societies in their project.

«g4» Students identified key concepts, definitions, and facts associated with positive impacts of computer technology in their project.

«g5» Students identified key concepts, definitions, and facts associated with negative impacts of computer technology in their project.

«g6» Students demonstrated appropriate and comprehensive critical thinking skills and habits of mind to analyze, evaluate and synthesize evidence in their project.

«g7» Students recognized and suggested appropriate remedies for activities involving computing technology which affect adversely users of computing technologies in their project.

Student Outcome (h): *Recognition of the need for and an ability to engage in continuing professional development.*



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«h1» Students identified the competencies and knowledge required by particular application domains in their project.

«h2» Students demonstrated knowledge of the history of computing and the rapidly evolving nature of the computing discipline in their project.

«h3» Students showed an understanding of what skill sets are currently desired by employers in their project.

«h4» Students showed knowledge of computer-related professional organizations (ACM, IEEE), publications, and conferences.

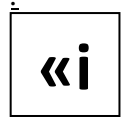
«h5» Students showed knowledge of various avenues for professional development past the undergraduate college experience.

«h6» Students demonstrated learning of a new development tool without instructor guidance in their project.

«h7» Students demonstrated the ability to research topics using the web, library, and professional publications in their project.

«h8» Students demonstrated ability to reflect on their learning process and their own understanding in their project.

Program Outcome (i): An ability to use current techniques, skills, and tools necessary for computing practice.



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

Self-ratings of competency are provided by the student project-team on the following scale:

5: Expert, 4: Advanced, 3: Competent, 2: Intermediate, 1: Novice

Check-mark is earned if the team's competency rating is 2 or higher.

«i1» Students used contemporary presentation and demonstration tools in their project.

«i2» Students developed artifacts using modern document preparation tools in their project.

«i3» Students employed management and/or version control software in their project.

«i4» Students utilized modeling software in their project.

«i5» Students utilized contemporary database management systems in their project.

«i6» Students performed web-based programming (server, web-page, etc.) in their project.

«i7» Students performed testing using contemporary validation/testing software in their project.

Student Outcome (j): An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

Mathematical Foundations



Enter **n/a** if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«j1» Students used math expressions in their project.

«j2» Students used logical expressions in their project.

«j3» Students used statistics in their project.

«j4» Students performed formal proofs.

«j5» Students implemented mathematical algorithms.

«j6» Students developed models in their project.

«j7» Students demonstrated the use of design trade off in their project.

Student Outcome (k): *An ability to apply design and development principles in the construction of software systems of varying complexity.*



Enter n/a if this Knowledge Area is not significantly represented in this project. Otherwise, please record the number of checked criteria, up to a maximum of 5.

«k1» Students contributed in the design and development of a small-, medium-, or large-scale software system in their project.

«k2» Students demonstrated understanding of the Software Development Life Cycle in their project.

«k3» Students developed Project Specification in their project.

«k4» Students performed Feasibility Study and/or develop Project Plan in their project.

«k5» Students developed Requirements Documentation in their project.

«k6» Students developed Design Documentation in their project.

«k7» Students performed and documented testing and/or evaluation of the implementation in their project.

«k8» Students performed system walkthroughs in their project.

Notes: «Notes»

APPENDIX G-2: Senior Project Assessment Results – Summer 2015

CIS 4911 - Senior Project		Summer 2015									
	<u>Outco</u> <u>me</u> <u>(a)</u>	<u>Outco</u> <u>me</u> <u>(b)</u>	<u>Outco</u> <u>me (c</u> <u>)</u>	<u>Outco</u> <u>me</u> <u>(d)</u>	<u>Outco</u> <u>me</u> <u>(e)</u>	<u>Outco</u> <u>me (f)</u>	<u>Outco</u> <u>me</u> <u>(g)</u>	<u>Outco</u> <u>me</u> <u>(h)</u>	<u>Outco</u> <u>me (i)</u>	<u>Outco</u> <u>me (j)</u>	<u>Outco</u> <u>me</u> <u>(k)</u>
Project 1	3	5	4	5	3	5		4	5	3	5
Addigy_Ver3	3	5	4	5	3	5		4	5	4	5
Project 2	3	5	4	5	3	5		4	5	3	5
BOLO_Ver2	3	5	4	5	3	5		4	5	4	5
Project 3	3	5	4	5	3	5		4	5	3	5
CP_Ver6	3	5	5	5	3	5		4	5	4	5
Project 4	3	5	4	5	3	5		4	5	3	5
GenSeqV_Ver1	3	5	5	5	3	5		4	5	4	5
Project 5	3	5	4	5	3	5		4	5	3	5
InfTrav_Ver1	3	5	5	5	3	5		4	5	4	5
Project 6	3	5	4	5	3	5		4	5	3	5
MobJud_Ver6	3	5	5	5	3	5		4	5	4	5
Project 7	3	5	4	5	3	5		4	5	3	5
NIBBL_Ver2	3	5	4	5	3	5		4	5	4	5
Project 8	3	5	4	5	3	5		4	5	3	5
SPW_Ver6	3	5	5	5	3	5		4	5	4	5
Project 9	3	5	4	5	3	5		4	5	3	5
SkillCrt_Ver2	3	5	5	5	3	5		4	5	4	5
Project 10	3	5	4	5	3	5		4	5	3	5

SB_Ver2	3	5	5	5	3	5		4	5	3	5
Project 11	3	5	4	5	3	5		4	5	3	5
TMA_Ver 2	3	5	5	5	3	5		4	5	4	5
Project 12	3	5	4	5	3	5		4	5	3	5
VJF_Ver6	3	5	5	5	3	5		4	5	4	5
Project 13	3	5	4	5	3	5		4	5	3	5
VirLab_Ver3	3	5	5	5	3	5		4	5	4	5
	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome (c</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome (f)</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome (i)</u>	<u>Outcome (j)</u>	<u>Outcome</u>
	<u>(a)</u>	<u>(b)</u>	<u>)</u>	<u>(d)</u>	<u>(e)</u>		<u>(g)</u>	<u>(h)</u>			<u>(k)</u>
Mean	3	5	4.35	5	3	5		4	5	3.45	5

APPENDIX G-3: Senior Project Assessment Results – Fall 2015

CIS 4911 - Senior Project		Fall 2015									
	<u>Outco</u> <u>me</u> <u>(a)</u>	<u>Outco</u> <u>me</u> <u>(b)</u>	<u>Outco</u> <u>me (c</u> <u>)</u>	<u>Outco</u> <u>me</u> <u>(d)</u>	<u>Outco</u> <u>me</u> <u>(e)</u>	<u>Outco</u> <u>me (f)</u>	<u>Outco</u> <u>me</u> <u>(g)</u>	<u>Outco</u> <u>me</u> <u>(h)</u>	<u>Outco</u> <u>me (i)</u>	<u>Outco</u> <u>me (j)</u>	<u>Outco</u> <u>me</u> <u>(k)</u>
Project 1	4	5	5	5	4	5		4	5	3	5
Addigy_ Ver4	4	5	5	5	4	5		4	5	3	5
Project 2	3	5	4	5	3	5		4	5	3	5
BOLO_V er3	3	5	4	5	3	5		4	5	3	5
Project 3	4	5	4	5	3	5		4	5	4	5
DMP_Ve r1	4	5	4	5	3	5		4	5	4	5
Project 4	3	5	4	5	3	5		4	5	3	5
EVU_Ver 1	3	5	4	5	3	5		4	5	3	5
Project 5	3	5	4	5	3	5		4	5	3	5
GPA- TF_Ver1	3	5	4	5	3	5		4	5	3	5
Project 6	3	5	4	5	3	5		4	5	3	5
GenPro_ Ver2	3	5	4	5	3	5		4	5	3	5
Project 7	3	5	4	5	3	5		4	5	3	5
GLSA_Ve r1	3	5	4	5	3	5		4	5	3	5
Project 8	3	5	4	5	3	5		4	5	3	5
LW_Ver 1	3	5	4	5	3	5		4	5	3	5
Project 9	3	5	4	5	3	5		4	5	4	5
Mmate_ Ver1	3	5	4	5	3	5		4	5	4	5

Project 10	3	5	4	5	3	5		4	5	3	5
RM Cuff_Ver1	3	5	4	5	3	5		4	5	3	5
Project 11	3	5	4	5	3	5		4	5	3	5
SPT_Ver 7	3	5	4	5	3	5		4	5	3	5
Project 12	3	5	4	5	3	5		4	5	3	5
SkC_Ver 3	3	5	4	5	3	5		4	5	3	5
Project 13	3	5	4	5	3	5		4	5	3	5
SB_Ver3	3	5	4	5	3	5		4	5	3	5
Project 14	3	5	5	5	3	5		4	5	3	5
SMS_Ver 1	3	5	5	5	3	5		4	5	3	5
Project 15	3	5	4	5	3	5		4	5	3	5
TAMGF_Ver3	3	5	4	5	3	5		4	5	3	5
Project 16	3	5	4	5	3	5		4	5	3	5
UQC_Ver 1	3	5	4	5	3	5		4	5	3	5
Project 17	3	5	4	5	3	5		4	5	3	5
VRC_Ver 1	3	5	4	5	3	5		4	5	3	5
Project 18	3	5	4	5	3	5		4	5	3	5
VC_Ver1	3	5	4	5	3	5		4	5	3	5
Project 19	3	5	5	5	3	5		4	5	3	5

WCE_Ver1	3	5	5	5	3	5		4	5	3	5
	<u>Outcome (a)</u>	<u>Outcome (b)</u>	<u>Outcome (c)</u>	<u>Outcome (d)</u>	<u>Outcome (e)</u>	<u>Outcome (f)</u>	<u>Outcome (g)</u>	<u>Outcome (h)</u>	<u>Outcome (i)</u>	<u>Outcome (j)</u>	<u>Outcome (k)</u>
Mean	3.10526	5	4.15789	5	3.05263	5		4	5	3.10526	5

APPENDIX G-4: Senior Project Assessment Results – Spring 2016

CIS 4911 - Senior Project			Spring 2016								
	<u>Outcome</u> <u>(a)</u>	<u>Outcome</u> <u>(b)</u>	<u>Outcome</u> <u>(c)</u>	<u>Outcome</u> <u>(d)</u>	<u>Outcome</u> <u>(e)</u>	<u>Outcome</u> <u>(f)</u>	<u>Outcome</u> <u>(g)</u>	<u>Outcome</u> <u>(h)</u>	<u>Outcome</u> <u>(i)</u>	<u>Outcome</u> <u>(j)</u>	<u>Outcome</u> <u>(k)</u>
Project 1	3	5	4	5	3	5		4	5	3	5
BOLO_Ver4	3	5	4	5	3	5		4	5	3	5
Project 2	3	5	4	5	3	5		4	5	3	5
CarReco_Ver1	3	5	4	5	3	5		4	5	3	5
Project 3	3	5	4	5	3	5		4	5	3	5
CRS_Ver1	3	5	4	5	3	5		4	5	3	5
Project 4	3	5	4	5	3	5		4	5	3	5
GenPro_Ver3	3	5	4	5	3	5		4	5	3	5
Project 5	3	5	4	5	3	5		4	5	3	5
GLS_Ver2	3	5	4	5	3	5		4	5	3	5
Project 6	3	5	4	5	3	5		4	5	3	5
GPA-Tr_Ver2	3	5	4	5	3	5		4	5	3	5
Project 7	3	5	4	5	3	5		4	5	3	5
HDesk_Ver1	3	5	4	5	3	5		4	5	3	5

Project 8	3	5	4	5	3	5		4	5	3	5
LW_Ver 2	3	5	4	5	3	5		4	5	3	5
Project 9	3	5	4	5	3	5		4	5	3	5
RobArm_Ver1	3	5	4	5	3	5		4	5	4	5
Project 10	3	5	4	5	3	5		4	5	3	5
SkillCrt_Ver4	3	5	4	5	3	5		4	5	3	5
Project 11	3	5	4	5	3	5		4	5	3	5
SB_Ver 4	3	5	4	5	3	5		4	5	3	5
Project 12	3	5	4	5	3	5		4	5	3	5
TAM_Ver4	3	5	4	5	3	5		4	5	3	5
Project 13	3	5	4	5	3	5		4	5	3	5
UrbThtr_Ver1	3	5	4	5	3	5		4	5	3	5
Project 14	3	5	4	5	3	5		4	5	3	5
VIP_Ver2	3	5	4	5	3	5		4	5	3	5
	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>
	<u>(a)</u>	<u>(b)</u>	<u>(c)</u>	<u>(d)</u>	<u>(e)</u>	<u>(f)</u>	<u>(g)</u>	<u>(h)</u>	<u>(i)</u>	<u>(j)</u>	<u>(k)</u>
Mean	3	5	4	5	3	5		4	5	3.05	5

APPENDIX G-5: Senior Project Assessment Results – Summer 2016

CIS 4911 - Senior Project			Summer 2016								
	<u>Outcome</u> <u>(a)</u>	<u>Outcome</u> <u>(b)</u>	<u>Outcome</u> <u>(c)</u>	<u>Outcome</u> <u>(d)</u>	<u>Outcome</u> <u>(e)</u>	<u>Outcome</u> <u>(f)</u>	<u>Outcome</u> <u>(g)</u>	<u>Outcome</u> <u>(h)</u>	<u>Outcome</u> <u>(i)</u>	<u>Outcome</u> <u>(j)</u>	<u>Outcome</u> <u>(k)</u>
Project 1	3	5	4	5	3	5		4	5	3	5
ADP_Ver1	3	5	4	5	3	5		4	5	3	5
Project 2	3	5	4	5	3	5		4	5	3	5
BOLO_Ver5	3	5	4	5	3	5		4	5	3	5
Project 3	3	5	4	5	3	5		4	5	3	5
SkillCrt_Ver5	3	5	4	5	3	5		4	5	3	5
Project 4	3	5	4	5	3	5		4	5	3	5
SB_Ver5	3	5	4	5	3	5		4	5	3	5
Project 5	3	5	4	5	3	5		4	5	3	5
TAM_Ver5	3	5	4	5	3	5		4	5	3	5
Project 6	3	5	4	5	3	5		4	5	3	5
VIP_Ver3	3	5	4	5	3	5		4	5	3	5
Mean	3	5	4	5	3	5		4	5	3	5

APPENDIX G-6: Senior Project Assessment Results – Fall 2016

CIS 4911 - Senior Project		Fall 2016									
	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>
	<u>(a)</u>	<u>(b)</u>	<u>(c)</u>	<u>(d)</u>	<u>(e)</u>	<u>(f)</u>	<u>(g)</u>	<u>(h)</u>	<u>(i)</u>	<u>(j)</u>	<u>(k)</u>
Project 1	3	5	5	5	4	5		4	5	3	5
Addigy_Ver6	4	5	5	5	4	5		4	5	3	5
Project 2	3	5	4	5	3	5		4	5	3	5
AANS_Ver1	3	5	4	5	3	5		4	5	3	5
Project 3	3	5	4	5	3	5		4	5	3	5
AgRob_Ver1	3	5	4	5	3	5		4	5	3	5
Project 4	3	5	4	5	3	5		4	5	3	5
AD4B_Ver1	3	5	4	5	3	5		4	5	3	5
Project 5	3	5	4	5	3	5		4	5	3	5
BOLO_Ver6	3	5	4	5	3	5		4	5	3	5
Project 6	3	5	4	5	3	5		4	5	3	5
EVADG_Ver1	3	5	5	5	3	5		4	5	3	5
Project 7	3	5	4	5	3	5		4	5	3	5
GPATF_Ver3	3	5	4	5	3	5		4	5	3	5
Project 8	3	5	4	5	3	5		4	5	3	5
FlagApp_Ver1	4	5	4	5	3	5		4	5	3	5
Project 9	3	5	4	5	3	5		4	5	3	5
GLS_App_Ver3	3	5	4	5	3	5		4	5	3	5

Project 10	3	5	4	5	3	5		4	5	3	5
ICSSPP_Ver1	3	5	4	5	3	5		4	5	3	5
Project 11	3	5	4	5	3	5		4	5	3	5
LOFSN_Ver1	3	5	5	5	3	5		4	5	3	5
Project 12	3	5	4	5	3	5		4	5	3	5
LAR_Ver1	3	5	4	5	3	5		4	5	3	5
Project 13	3	5	4	5	3	5		4	5	3	5
LW_Ver3	3	5	4	5	3	5		4	5	3	5
Project 14	3	5	4	5	3	5		4	5	3	5
TAM_Ver5	3	5	4	5	3	5		4	5	3	5
Project 15	3	5	4	5	3	5		4	5	3	5
MMIP_Ver2	3	5	4	5	3	5		4	5	3	5
Project 16	3	5	4	5	3	5		4	5	3	5
Neat_Ver1	3	5	4	5	3	5		4	5	3	5
Project 17	3	5	4	5	3	5		4	5	3	5
OCMS_Ver1	3	5	4	5	3	5		4	5	3	5
Project 18	3	5	4	5	3	5		4	5	3	5

PSN_Ver1	3	5	4	5	3	5		4	5	3	5
Project 19	3	5	4	5	3	5		4	5	3	5
SkillCourt_Ver6	3	5	4	5	3	5		4	5	3	5
Project 20	3	5	4	5	3	5		4	5	3	5
APP_Ver1	3	5	4	5	3	5		4	5	3	5
Project 21	3	5	4	5	3	5		4	5	3	5
ALHAL_Ver1	3	5	4	5	3	5		4	5	3	5
Project 22	3	5	4	5	3	5		4	5	3	5
VIP_Ver4	3	5	4	5	3	5		4	5	3	5
Project 23	3	5	4	5	3	5		4	5	3	5
VMAXP_Ver1	3	5	4	5	3	5		4	5	3	5
Project 24	3	5	4	5	3	5		4	5	3	5
VRC_Ver2	3	5	4	5	3	5		4	5	3	5
	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>
	<u>(a)</u>	<u>(b)</u>	<u>(c)</u>	<u>(d)</u>	<u>(e)</u>	<u>(f)</u>	<u>(g)</u>	<u>(h)</u>	<u>(i)</u>	<u>(j)</u>	<u>(k)</u>
Mean	3.1	5	4.15	5	3.1	5		4	5	3	5

APPENDIX G-7: Senior Project Assessment Results – Spring 2017

CIS 4911 - Senior Project			Spring 2017								
	<u>Outcome</u> (a)	<u>Outcome</u> (b)	<u>Outcome</u> (c)	<u>Outcome</u> (d)	<u>Outcome</u> (e)	<u>Outcome</u> (f)	<u>Outcome</u> (g)	<u>Outcome</u> (h)	<u>Outcome</u> (i)	<u>Outcome</u> (j)	<u>Outcome</u> (k)
Project 1	3	5	4	5	3	5		4	5	3	5
ADB_Ver2	3	5	4	5	3	5		4	5	3	5
Project 2	3	5	4	5	3	5		4	5	3	5
BOLO_Ver7	3	5	4	5	3	5		4	5	3	5
Project 3	3	5	4	5	3	5		4	5	3	5
BrHome_Ver1	3	5	5	5	3	5		4	5	4	5
Project 4	3	5	4	5	3	5		4	5	3	5
CIC_Ver1	3	5	4	5	3	5		4	5	3	5
Project 5	3	5	4	5	3	5		4	5	3	5
EVAD_Ver2	3	5	5	5	3	5		4	5	3	5
Project 6	3	5	4	5	3	5		4	5	3	5
FM_Ver1	3	5	4	5	3	5		4	5	3	5
Project 7	3	5	4	5	3	5		4	5	3	5
GoDutch_Ver1	3	5	4	5	3	5		4	5	3	5
Project 8	3	5	4	5	3	5		4	5	3	5
HILEU_Ver1	3	5	4	5	3	5		4	5	3	5
Project 9	3	5	4	5	3	5		4	5	3	5

LWAR_ Ver2	3	5	4	5	3	5		4	5	3	5
Project 10	3	5	4	5	3	5		4	5	3	5
MMIP_ Ver3	3	5	4	5	3	5		4	5	3	5
Project 11	3	5	4	5	3	5		4	5	3	5
MyVIPC_ Ver1	3	5	4	5	3	5		4	5	3	5
Project 12	3	5	4	5	3	5		4	5	3	5
NewsPla t_ Ver1	3	5	4	5	3	5		4	5	3	5
Project 13	3	5	4	5	3	5		4	5	3	5
NGN_ Ver1	3	5	4	5	3	5		4	5	3	5
Project 14	3	5	4	5	3	5		4	5	3	5
OCMS_ Ver2	3	5	4	5	3	5		4	5	3	5
Project 15	3	5	4	5	3	5		4	5	3	5
SkillCrt_ Ver7	3	5	4	5	3	5		4	5	3	5
Project 16	3	5	4	5	3	5		4	5	3	5
SwiWeb_ Ver1	3	5	4	5	3	5		4	5	3	5
Project 17	3	5	4	5	3	5		4	5	3	5
TAM_ Ver6	3	5	4	5	3	5		4	5	3	5

Project 18	3	5	4	5	3	5		4	5	3	5
TrafSim_Ver1	3	5	4	5	3	5		4	5	3	5
Project 19	3	5	4	5	3	5		4	5	3	5
VIP_Ver 5	3	5	4	5	3	5		4	5	3	5
Project 20	3	5	4	5	3	5		4	5	3	5
VIR_Ver 1	3	5	4	5	3	5		4	5	3	5
	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>	<u>Outcome</u>
	<u>(a)</u>	<u>(b)</u>	<u>(c)</u>	<u>(d)</u>	<u>(e)</u>	<u>(f)</u>	<u>(g)</u>	<u>(h)</u>	<u>(i)</u>	<u>(j)</u>	<u>(k)</u>
Mean	3	5	4.1	5	3	5		4	5	3.05	5

APPENDIX G-8:

Senior Project Assessment Results Summary – Summer 2015 to Spring 2017

		Student Outcomes in CIS 4911 --- 2015-2017 Cycle										
		Mean Outcome Results										
	# Proj ects	<u>Outc ome</u> (a)	<u>Outc ome</u> (b)	<u>Outc ome</u> (c)	<u>Outc ome</u> (d)	<u>Outc ome</u> (e)	<u>Outc ome</u> (f)	<u>Outc ome</u> (g)	<u>Outc ome</u> (h)	<u>Outc ome</u> (i)	<u>Outc ome</u> (j)	<u>Outc ome</u> (k)
Sum mer 2015	13	3.00	5.00	4.35	5.00	3.00	5.00		4.00	5.00	3.45	5.00
Fall 2015	19	3.11	5.00	4.16	5.00	3.05	5.00		4.00	5.00	3.11	5.00
Sprin g 2016	14	3.00	5.00	4.00	5.00	3.00	5.00		4.00	5.00	3.05	5.00
Sum mer 2016	6	3.00	5.00	4.00	5.00	3.00	5.00		4.00	5.00	3.00	5.00
Fall 2016	24	3.10	5.00	4.15	5.00	3.10	5.00		4.00	5.00	3.00	5.00
Sprin g 2017	20	3.00	5.00	4.10	5.00	3.00	5.00		4.00	5.00	3.05	5.00
Final Score s	96	3.05	5.00	4.14	5.00	3.04	5.00		4.00	5.00	3.10	5.00

APPENDIX H: Student Organization Reports

FIU-ACM Student Chapter Activities

Summer 2015 through Spring 2017. Report by Kip Irvine, Faculty Advisor. Specific attendance figures are not known. Overall, student leaders reported that meetings were attended by an average of 20 students, and workshops by an average of 15 students.

1. *Code in the Dark*: 10/23/2015. Code In The Dark is a 15-minute mini-Hackathon where people are asked to clone a website that the presenter will show, in HTML and CSS (and if you have good enough Javascript skills, Javascript it is), in 15 minutes. No tools, no previews, no syntax highlighting and no reference guides of code - just your raw talent and skill in the small time limit of 15 minutes!
2. Data Science and Databases Workshop: 11/13/2015.
3. Introduction to the Robot Operating System: 11/20/2015
4. First General Meeting, Spring 2016: 1/22/2016
5. Global Game Jam: 1/31/2016 (joint event with other clubs)
6. Mango Hacks: 3/4/2016 (joint event with other clubs)
7. Second General Meeting, Spring 2016: 2/19/2016
8. First General Meeting, Fall 2016: 9/1/2016
9. Workshop: Starting up with Developer Tooling: 9/8/2016. Learn about Git, Python with Python Version Manager/Pip/Virtualenv, Node with Node Version Manager, Docker, and a good Text Editor.
10. Programming Team Qualifier: 9/9/2016. Winners of this competition were offered membership in the FIU Programming team that competes against the top universities in the Southeast USA.
11. Tech Internship Experience: 9/15/2016. Several students who have previously served in a tech summer internship spoke about their experiences. Located in PG6-106. 4-6pm.
12. Second General Meeting, Fall 2016: 9/29/2016.
13. Workshop: Your Personal Website: 10/6/2016. Interactive workshop about building your personal website. Participants will build a basic website and gain valuable knowledge about developing your personal brand.
14. Workshop: Web Apps and Javascript: 10/13/2016. Join FIU ACM for an interactive workshop about web applications and Javascript. Participants will learn about several web applications and the basics of Javascript, as well as popular tools to use in a web development environment.
15. Third General Meeting: 10/27/2016
16. Workshop: Data Structures and Algorithms: 11/3/2016. Tech talk on Data Structures and algorithms. These are two of the most popular areas of the advancement in the computing field and they will continue to shape the industry for the foreseeable future.

17. Workshop: Functional Programming Principles. 11/10/2016. Interactive workshop about the principles of functional programming languages. Learn the advantages of these languages and the differences with object-oriented languages.
18. Fourth General Meeting: 12/1/2016.
19. Git Started on Dev / First General Meeting: 1/13/2017.
20. Workshop: OS Architectures: 1/20/2017
21. Workshop: Machine Learning: 1/27/2017
22. Workshop: Swift programming language: 2/3/2017
23. Workshop: Emacs With Lisp, and Second general Meeting: 2/10/2017
24. Workshop: ML classification: 2/17/2017
25. Workshop: Functions and Streams: 3/3/2017
26. Workshop: Art of Self- Learning, and Last General Meeting: 3/24/2017
27. Workshop: Databases: 4/7/2017

STARS Activities Report: Summer 2015 – Spring 2017

2015-2016:

- **Peer tutoring** available to all SCIS students covering multiple courses, with primary focus on Java programming, database, and networking
- **Volunteer peer tutoring** to students in other disciplines taking CGS service courses (CGS 2060, 2100, 2518), including one-on-one sessions, online help sessions, and exam review sessions
- **Rise Up 4 CS program:** outreach tutoring and mentoring for high school students from underrepresented groups who are taking the AP-CS A exam. This was funded by a Google Grant domiciled at Georgia Tech. 6 of the 8 students who completed our program scored a perfect 5 of 5 on the AP CS A exam.
- **Meetings and Presentations:** STARS hosted several guest speakers for topics on resume creation, job interview practice, and a presentation by the “mad scientist” of Miami Children’s Hospital.
- **STARS Celebration:** We sent 6 students to the annual 3-day Celebration conference for leadership training.
- **Two STARS members were designated as outstanding SCIS graduates**

2016-2017:

- **Peer tutoring** available to all SCIS students covering multiple courses, with primary focus on Java programming, database, and networking
- **Volunteer peer tutoring** to students in other disciplines taking CGS service courses (CGS 2060, 2100, 2518), including one-on-one sessions, online help sessions, and exam review sessions
- **Academic Integrity International Day of Action:** STARS manned a table in the SCIS atrium to raise awareness for academic integrity. We had an interactive video for participants to use, and provided snacks and handouts.
- **Rise Up 4 CS program:** outreach tutoring and mentoring for high school students from underrepresented groups who are taking the AP-CS A exam. We started in October with approximately 45 students, and ended with a core group of approximately 16 students who attended sessions regularly. We held webinar sessions twice per week through the end of April, and also monthly on-campus sessions. This is the 3rd time that we have offered this program. Although we do not yet have AP exam scores, in prior years those who completed the program have scored very well on the exam.
- **Presentations:** STARS hosted Victoria Rios, a local high school student who has created a mobile phone app designed to help individuals learn sign language for communication with the deaf.

- **Two STARS members were designated as outstanding SCIS graduates in Spring 2017**
- **One STARS member was designated as outstanding SCIS graduates in Fall 2017**



- **Java midterm and final exam review sessions** were held. Our final exam review session in the Spring semester consisted of a Java Jeopardy competition open to FIU students taking the first or second Java course, plus our Rise Up 4 CS program attendees. First prize was a quadcopter drone. Photos below.





Second place team: AP CS High school students

Upsilon Pi Epsilon Report
Summer 2015 to Spring 2017

Upsilon Pi Epsilon (UPE) is the international honor society for students in computer science, information technology, computer engineering, and management information systems. During the past two years the Florida International University (FIU) UPE honors society continued to engage students in activities such as workshops, social events, and collaborative projects with other student organizations in the School of Computing and Information Sciences (SCIS). The number of inductees and the attendance at events continue to grow, currently there are 300 members and 150 inductees. The FIU chapter of UPE has won a number of awards during the reporting period including the Outstanding Chapter Award presented by the National UPE organization, Outstanding Engineering Organization Award presented by the FIU Council for Student Organizations (CSO), and earned CSO special allocations of funds for three consecutive semesters, among others.

UPE continues to coordinate the SCIS town hall meeting (Spring 2016 and Spring 2017) where students meet the Director, Associate Director and faculty of SCIS. During the meeting the Directors present the vision of the school, inform students of any changes to the degree programs, and more importantly, are available to answer any questions the students may have pertaining to the school. The town hall meeting is held annually and is a collaborative effort with the other student organizations in SCIS including ACM@FIU, PLUG, STARS, and WICS. The number of activities sponsored by UPE or in which UPE participated has increase greatly since the last report. It is estimated that UPE coordinates at least 10 event every semester, including: workshops – web development, database management, hardware (Arduino), mobile app development, and graphic design, among others; information sessions – Google, State Farm, Amazon, and Progressive; community service events – Google Ignite CS, and CodeFest Miami; other events – gaming tournament, Mango Hacks, Tech for the Future (VR, AT, and IoT), and STEMCon, among others.

As previously stated the membership in UPE continues to grow as shown by the four induction ceremonies held in Fall 2015, Spring 2016, Fall 2016, and Spring 2017. The main challenge continues to be space for the organization to store its materials and for the UPE student leaders to use. We expect that SCIS will provide office space in the near future to UPE for use by its members, and if this is not feasible a shared space for use by the SCIS student organizations.

Finally, the student members of the e-board must be congratulated for doing an outstanding job in coordinating the various activities and collaborating with other student organizations. Cesar Villa-Garcia continues to be the driving force behind the success of the FIU chapter of UPE.

Peter Clarke

UPE Faculty Advisor

Activities of WICS Student Chapter Summer 2015 to Spring 2017

Info Sessions:

- LaunchCode@Fiu Info Session
- State Farm Ice Cream Social, Sept 15, 2015
- American Express, September 9, 2015
- Lockheed Martin/Tech Talk, September 30, 2015
- Hilton Software

Events:

- Programming Team Qualifier, Oct 3, 2015 (Programming Team Events)
- Ada Lovelace Day, October 13, 2015
- MLH Hackday, October 10, 2015
- Programming Team Meetings: Mondays, Tuesdays and Thursdays
- High Tea
- Gym with Geeticka (VP)
- Github Lectures with ACM
- Game Dev Workshop
- Web Dev Workshop
- Google Made with Code
- CodeFest
- Movie Night - Sept 16, 2016
- Programming Team Tryouts - Sept 9, 2016
- Afternoon Tea - Feb 12, 2016

Workshops:

- Soldering Workshop, Sept 28, 2015
- PLUG Arduino Workshop, Oct 1, 2015
- Web Dev
- Soldering Workshop, Feb 19, 2016

Socials:

- Bowling Night

Appendix-I: Minutes of SCIS Industrial Advisory Board Meetings

**INDUSTRY ADVISORY BOARD
Florida International University
School of Computing and Information Sciences**

Board Meeting Actions and Summary (DRAFT)

December 11th, 2015

Florida International University

Miami, FL

Board Member Attendance:

- Pete Martinez, IAB Chair, Chairman and CEO, Game Changer Tec, LLC
- Dr. Roy Gerber, IAB Vice-Chair, Managing Member, L3W, LLC
- Jaime Borrás, CEO, Wireless Silicon Group, and Senior Fellow, Motorola Mobile Devices
- Christopher Fleck, Vice President of Community and Solutions Development
- Thomas Packert, VP of Information Management, Orthosensor

FIU Representation:

- Dr. Ram Iyengar, Director and Ryder Professor, FIU SCIS
- Dr. Peter Clarke, FIU SCIS Assoc. Professor
- Ray Chang-Lua, FIU MSCS Alumni
- Steven Luis, Director of Technology and Business Relations, FIU SCIS

Board Meeting Summary

1. Mr. Martinez begins the meeting at 5:07pm.
2. Mr. Martinez makes his opening remarks.
 - a. He states how the School has evolved over many years, both in research activities and the curriculum.
 - b. He highlights how the industry has also changed and the emergence of new trends like Internet of Things. He points to the innovations at Intel, Samsung and others. Device companies don't know what to do with the all the data being acquired. Further they don't know how to contextualize the data. This is where Big Data analytics steps in.
 - c. Hardware companies are being exposed to new uses of these technologies in the Biomedical field. Software companies like IBM and their Watson product are being used to

- analyze health problems. Combining these two technologies is they future. He points out Dr. Gerber's role in mentoring a biomedical student.
- d. There will be a growing need for data engineers who understand and can apply AI and deep learning techniques to take advantage of these emerging opportunities.
3. Mr. Martinez asks Board members and guests to introduce themselves.
 4. Dr. Iyengar presents his Report to the Board (see Board Materials for details)
 - a. He provides an overview of recent School metrics including enrollment, degrees awarded, PhD degrees, research publications, awards and proposals.
 - b. He highlights several initiatives such as our Master's in Cybersecurity, Tech Station, Outreach and Conferences.
 - c. Mr. Martinez comments on what a great story the School has developed.
 - d. Board members discuss the impact of metrics and accomplishments of the School. Much discussion is centered around enrollment processes to improve the quality of student.
 - e. Patent and technology transfer are discussed. Mr. Martinez is interested to meet FIU Director of IP Office.
 - f. Dr. Iyengar thanks Board members for attending the meeting and for their participation in our school's activities.
 5. Dr. Clarke provides information about his Startup and proof-of-concept product. (See Board Materials).
 - a. Dr. Clarke describes the genesis of the software training education system.
 - b. He describes work complete at NSF ICorp to validate tech transfer value of technology and the pivot needed.
 - c. Mr. Lua describes the business model and project mockups.
 - d. Dr. Clarke discusses next steps including industry support letters for the next round of SBIR deadlines.
 - e. Board members discuss the application of the training system to multiple vertical domains. They discuss adoption issues and competitive products.
 6. Senior Project Students present their projects and provide Board members with demos.
 7. Mr. Martinez asks Board members to provide their feedback and comments.
 - a. Mr. Borrás congratulates Dr. Sadjadi for his work with the Senior Project students. Mr. Borrás comments how the projects are reflecting what is going on in industry today. He also states how the students are being taught with new tools and techniques important to industry.
 - b. Mr. Martinez comments on the excellent quality of the presentations given today by students. The students are very polished and professional. He sees many aspects that are important to good project management being demonstrated.
 - c. Mr. Fleck feels that projects the school is working on are great and incredibly relevant to what is going on in industry.
 - d. Dr. Gerber concurs with assessments made by Board members.
 8. Board member agree to meet again on May 6th 2016 to coincide with the next Senior Project Class.
 9. Mr. Martinez makes his closing remarks. He thanks Board members for their attendance. He summarizes many of the comments and points made at the meeting. Pointing out how the School has grown to the point where it is now creating startups and engaging students in very relevant industry areas.
 10. Mr. Martinez closes the meeting at 7:21pm.

Summary of Board Actions

1. 4/29/11: Board members offer to assist school reach out to local companies to broaden participation in the school development. Terremark and Cruise Lines are suggested as the first companies to approach. School to obtain FIU Foundation approval to begin discussions with these companies. Continue development with incoming Director. 9/16/11: We have Foundation approval to open discussion with RCL. 12/2/12: Foundation has given approval to approach RCL. 4/27/12: Mr. Silvestre will reach out to RCCL for interest to participate on the Board. 9/14/12: Mr. Silvestre presented two new Board members from RCCL: Max Schmidt and Jose Machado. 12/7/13: Dr. Gerber introduces new Board member Thomas Packert, VP of Information Management, Orthosenor. Board members continue to pursue potential Board member prospects.
2. 9/13/13: Conduct an employment survey with 2013-14 graduating seniors. Report findings of survey.

Summary of Closed/Tabled Actions

1. **FL Governor Discussion:** 8/19/05: Mr. Braun has requested Dr. Deng investigate the cost of a study to better understand IT employment attraction and retention issues in South Florida. The study will be used as a basis for a discussion with Florida's Governor, Mr. Braun, Board members and Dr. Maidique/FIU. 12/9/05: The cost for the IT employment study request by Mr. Braun is \$60K. The Board defers this item to Mr. Braun for further discussion. 5/26/06: Board members expressed concern regarding the \$60K needed to conduct the survey. Board members agreed to postpone discussion on action until next Governor takes office.
Board Action: 12/09/05 Tabled, till 2007.
2. **Industry Center:** 8/19/05: The Board supports the new direction for boot-strapping funding for an industry center by creating an "umbrella" of research projects that members can fund and/or pursue funding joint funding from Federal agencies. The Board requests to be informed with progress in this area. 12/9/05: The school and Board members are having ongoing discussions regarding joint projects and funding opportunities. The LA Grid Program is the outcome of conversations with IBM. The school will update Board members going forward. *Board Action: 12/09/05 Closed*
3. **Marketing:** 8/19/05: The Board requests that the school develop marketing materials to promote FIU, the school and its accomplishments. The Board suggests that this effort occur jointly with member companies with the goal of producing joint press releases. Mr. Braun offers the assistance of his staff for developing marketing and communications strategy. Mr. Braun felt that the marketing materials would be useful for recruiting new board members as well. Mr. Borrás has also offered marketing assistance. Dr. Prasad is hiring a publications/publicity staff member. Mr. Braun suggests that the three of these staff members meet to coordinate marketing efforts. The timing for this effort will depend on the resolution of the reorganization. 12/09/05: Ms. Santana offers assistance with marketing effort. School is working on new marketing materials and will follow-up with companies reporting progress as requested.
Board Action: 12/09/05 Closed

4. **NSF Award:** 8/19/05: Mr. Braun requests that if NSF awards the School with the BPC grant, the school should prepare joint press releases to promote the award to the community. 12/9/05: Grant was denied. Reviewer's comments were positive. School to reapply in Spring '06. School will update Board on progress.

Board Action: 12/09/05 Closed

5. **LA Grid:** 8/19/05: The Board expresses approval of the LA Grid initiative, a partnership between IBM, FIU and other universities. The Board asks to be kept informed of the activity. 12/9/05: Pete Martinez provides Board with overview of the LA Grid Program. School will update Board on progress.

Board Action: 12/09/05 Closed

6. **Board Action Procedures:** 12/9/05: The Board discussed several procedural mechanisms to process action items with the goal of closing action items out expeditiously. These procedures are:

- a. Once attending Board members, those present at the current meeting, decide to close an item it no longer needs to be discussed.
- b. If an action plan is put in place for a Board action item, the item should be closed. The party taking responsibility for the action plan should report to the Board periodically on the outcomes of the plan.
- c. It is sufficient for action to be taken on any agenda item by the attending Board members.
- d. Actions items accepted by the Board should establish a time limit with the understanding that action should be taken within that time or should be closed.
- e. The school will implement these procedures at upcoming meetings.

Board Action: 12/09/05 Closed

7. **IT Industry Scholarship Fund:** 12/9/06: The Board agreed to review a proposal by Dr. Deng to develop an industry-based funding mechanism for student scholarships to attract high quality students. Dr. Deng will develop the proposal and distribute to Board members as soon as possible. A conference call should be scheduled thereafter to discuss the proposal. 5/25/06: Board members agreed to pursue the Scholarship Fund Campaign. Mr. Luis prepared and distributed materials for Board members to discuss with their colleagues. 04/07: Tabled to obtain more Board member feedback and direction.

Board Action: 12/09/05 Open, pending review

8. **Business Continuity Information Network:** 12/07: Mr Braun suggests to Board members to reach out to their peers and networks to facilitate support. Board interested in sending letter of support on behalf of Centers of Excellence to lobby Gov. Board. Not pursued due to lobby rule limitations.

9. **Board Chair:** 9/12/08: Pete Martinez nominated and with a unanimous vote of the Board is elected as Board Chair. Dr. Meleis steps down as Board Vice-Chair. Mr. Martinez to nominate a Vice-Chair. 12/5/08: Dr. Roy Gerber is appointed Board Vice Chair. Closed

10. **School Move:** 12/4/09: Mr. Gerber receives a motion from the Board to create a draft letter to circulate to the Board member for comment/signature expressing concern for moving the School to the Engineering Center building. A letter was drafted, circulated, signed and delivered to FIU

Provost in Dec. 2009. Provost responded by stating that the School's future success is paramount in his decision and that the Board will be consulted before any decisions are made. *Closed*.

- 11. Student Mentoring:** 9/12/08: Mr. Martinez proposes and the Board members agree to support a Student Mentoring program whereby each Board members would become a mentor of a student of the school. Mr. Martinez asks that a list of potential student candidates be drawn up. 12/5/08: Mr. Luis provides Board with resumes of students interested in the Mentoring program via web location of Board Materials. 9/10/10: Mr. Borrás receives first student to mentor. *Ongoing*
- 12. Board Membership:** 8/19/05: The Board has identified 8 companies to pursue for Board membership. The Board has set as a goal to have 15 total members. FIU will work with Mr. Braun to further communicate (via letter/phone) with non-active board members and potential members we would ask to join. Board members are encouraged to participate in the recruitment process. 12/9/05: Nick Bowen/IBM and Armando Garcia/IBM withdraw from the Board. Pete Martinez is added. Board members agree to pursue 4 additional members. Dr. Meleis will contact Citrix. Pete Martinez will contact Telefonica. Mr. Braun has made initial contact with Global Crossing, requires follow-up. FIU will continue discussions with PBS&J. 5/26/06: Dr. Meleis invited Mr. Cristinziano, Citrix VP, who accepted invitation. Also, Board members agreed that the Board should become larger before developing sub-committees. 12/15/06: Mr. Cristinziano steps down due to relocation. 2/26/07: Conf. Call, two new Board members are introduced, Mr. Pallin and Mr. Buchenhorner, three additional members are begin sought by April Meeting. Membership stands at 12. 4/07: Board affirms that 15 members are sought by next meeting. Dr. Meleis suggested that the Board review the objectives of the Board to assist in identifying additional members to recruit. 9/07: Three new Board members are introduced, Mr. Bravo/Microsoft, Mr. Fleck/Citrix and Mr. Ugale/Crossbow Ventures. Dr. Meleis proposed that the Board finalize objectives and create committees to work on Board objectives. 12/07: Mr. Braun requests further information about the objectives of the school going forward to better align with Board committee development. Item deferred to next meeting. *Board Action: 12/9/05, closed*
- 13. Committees:** 9/12/08: Mr. Martinez proposes and the Boards passes the creation of two committees: Research and Talent Development. The Research Committee will help the school align its resources with Federal, State and local strategic investments and funding opportunities from the private and public sector. The Talent Development Committee will assist the school to develop programs to enhance student research and education experiences, further driving the competitiveness of our students. 12/5/08: Committees to meet via conf. call to formulate goals and actions. *Closed*
- 14. BS in Computer Science Program Educational Objectives and Student Outcomes:** 12/10/10: Dr. Navlakha presented the modified outcomes for the BS-CS program, and the Board unanimously concurred with the suggested modifications. The documents are available with Board materials. **CLOSED**
- 15. CS Senior Projects:** 12/10/10 : Board members request that there be regular presentations from Senior Project students. The dialog is beneficial for both industry and school. Student presentations

will be evaluated for Fall and Spring agenda based on quality and relative interest of the board.
CLOSED

- 16. *Technology Transfer Initiative:*** 9/10/10: Board members approve of the School's efforts to assist faculty and students accelerate the IP development process by improving licensing options, expediting IP review process, and providing pre-incubator technical and business support. Board members offer to provide further guidance. Mr. Luis to contact Board members with next steps.
CLOSED
- 17. *Collaborative Open Innovation Lab:*** 4/29/11: Board members express interest to participate as COIL mentors. Program is awaiting final approval. Mr. Luis to provide information to the Board regarding mentoring opportunity. 9/16/11: Waiting for final approval of program via External Programs/University College. 12/2/11. Mr. Luis updates Board members that the COIL program has started activities. CLOSED
- 18. *National Rankings:*** 9/16/11: Board members request to know the key metrics the school is tracking for improving national ranking. 12/2/11: Dr. Iyengar discusses rankings in his presentation. The NRC ranking is not due for another three years. CLOSED
- 19. *Intellectual Property:*** 9/16/11: Board members request to know more about intellectual property/patents efforts in the school. 12/2/11: Dr. Iyengar and Mr. Luis present information about IP at FIU. No further action is requested. CLOSED
- 20.** 12/2/12: Board Members have requested that the School begin tracking where its graduates are finding jobs and report back on findings periodically. 4/27/12: A survey of recent graduates was presented and an Alumni listing which is posted on the website is started. Updates will continue and reports given to the Board periodically. CLOSED.

INDUSTRY ADVISORY BOARD
Florida International University
School of Computing and Information Sciences

Board Meeting Actions and Summary (DRAFT)

May 5th, 2016

Florida International University

Miami, FL

Board Member Attendance:

- Pete Martinez, IAB Chair, Chairman and CEO, Game Changer Tec, LLC
- Dr. Roy Gerber, IAB Vice-Chair, Managing Member, L3W, LLC
- Jaime Borrás, CEO, Wireless Silicon Group, and Senior Fellow, Motorola Mobile Devices
- Juan Caraballo, Program Director, University Relations, IBM
- Christopher Fleck, Vice President, Emerging Solutions Citrix
- Thomas Packert, Chief Information Officer, CareTrader
- Bert Sylvestre, Vice President Business Development, Pro Logic Systems

FIU Representation:

- Dr. Shu-Ching Chen, Eminent Scholar Chaired Professor, FIU SCIS
- Dr. Mario Eraso, STEM Coordinator, FIU SCIS
- Dr. Ram Iyengar, Director and Ryder Professor, FIU SCIS
- Dr. Susan Jay, Executive Director of Development, FIU CEC
- Steven Luis, Director of Technology and Business Relations, FIU SCIS
- Jerry Miller, Discovery Lab Coordinator, FIU SCIS

Board Meeting Summary

1. Mr. Martinez begins the meeting at 5:22pm.
2. Mr. Martinez in his opening statements welcomes Board members and proceeds to discuss the engineering talent opportunities. He discusses engineering challenges in Cuba and efforts to engage.
3. Dr. Iyengar presents his report to the Board (see materials.)
 - a. Dr. Iyengar reviews relevant school metrics such as new research funding and current grant research activities.
 - b. He discusses efforts to develop the Cyber Center and CREST.

- c. He describes student achievements, new faculty hiring efforts, and the importance of multi-disciplinary efforts for visualization being pursued in ICARE.
- 4. Dr. Shu-Ching Chen presents his collaborative work in the ICARE.
 - a. Dr. Chen provides an overview of research and instructional projects such as the Globe Experience, Virtual Colonoscopy, and MineCraft Outreach.
 - b. Board members discuss industrial uses of VR technology applicable to the ICARE.
 - c. Mr. Sylvestre notes how there is significant linkage between Big Data analytics and VR applications.
 - d. Mr. Martinez notes how commercialization of these research activities should be an important goal of ICARE.
 - e. Dr. Iyengar states that ICARE provides a multi-disciplinary platform for collaboration similar to MIT Media lab.
- 5. Graduating Senior Computer Science Students present their projects to Board members. The Projects presented were:
 - a. Vertical Integrated Program System
 - b. HyperDesk
 - c. Bolo Flyer
- 6. Mr. Martinez asks Board members for their feedback.
 - a. Mr. Fleck states “projects keep getting better”. He notes that as these projects grow in scope it is important to identify a product owner who will provide continuity for the projects.
 - b. Mr. Fleck also requests information regarding the employment rate of our graduating CS students.
 - c. Mr. Packert agrees the projects are getting better, the quality of the software and the professionalism of the students. He states “These are students you can employ”. He also comments on how much the campus has grown and that he enjoys being on campus.
 - d. Mr. Sylvestre points out the applicability of the projects discussed. That the work being done at the school is relevant to real world problems that “I can use today”. He further states that this is a new business model for the school to capitalize on, “useful stuff”.
 - e. Mr. Borrás discusses the work to improve Senior Project class and how that is changing the culture of the School. He points out how Dr. Sadjadi has put together a strict framework for students to follow that relates to industry goals. He acknowledges industry mentorship is strong in the program and that it is important for validation of work being done by the students and due to this engagement students are better prepared for entering the workforce. He also comments how the School has been very successful at attracting the Faculty from the best programs in the Nation.
- 7. Mr. Luis discusses potential dates with Board members for the next meeting. The next meeting will be held in Dec. 2016 in conjunction with the Senior Project Showcase.
- 8. Mr. Martinez makes his final remarks again thanking Board members for attending and encouraging them to engage the School and University.
- 9. Mr. Martinez closes the meeting at 7:39pm.

Summary of Board Actions

1. 4/29/11: Board members offer to assist school reach out to local companies to broaden participation in the school development. Terremark and Cruise Lines are suggested as the first companies to approach. School to obtain FIU Foundation approval to begin discussions with these companies. Continue development with incoming Director. 9/16/11: We have Foundation approval to open discussion with RCL. 12/2/12: Foundation has given approval to approach RCL. 4/27/12: Mr. Silvestre will reach out to RCCL for interest to participate on the Board. 9/14/12: Mr. Silvestre presented two new Board members from RCCL: Max Schmidt and Jose Machado. 12/7/13: Dr. Gerber introduces new Board member Thomas Packert, VP of Information Management, Orthosenor. Board members continue to pursue potential Board member prospects.
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members offer to provide further guidance. Mr. Luis to contact Board members with next steps.
CLOSED

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**INDUSTRY ADVISORY BOARD
Florida International University
School of Computing and Information Sciences**

Board Meeting Actions and Summary (DRAFT)

Dec. 2nd, 2016

Florida International University

Miami, FL

Board Member Attendance:

- Pete Martinez, IAB Chair, Chairman and CEO, Game Changer Tec, LLC
- Jaime Borrás, CEO, Wireless Silicon Group, and Senior Fellow, Motorola Mobile Devices
- Juan Caraballo, Program Director, University Relations, IBM
- Christopher Fleck, Vice President, Emerging Solutions Citrix
- Thomas Packert, Chief Information Officer, CareTrader
- Bert Sylvestre, Vice President Business Development, Pro Logic Systems

FIU Representation:

- Dr. Ram Iyengar, Director and Ryder Professor, FIU SCIS
- Dr. Sam Ganzfried, Associate Professor, FIU SCIS
- Steven Luis, Director of Technology and Business Relations, FIU SCIS

Board Meeting Summary

1. Mr. Martinez begins the meeting at 5:00 pm.
2. Mr. Martinez in his opening statements welcomes Board members and proceeds to discuss opportunities to create academic and industry partnerships. He discusses such opportunities in medicine. He also points out the importance of industry feedback for the College of Engineering and Computing Dean Search.
3. Dr. Iyengar presents his report to the Board (see materials.)
 - a. Dr. Iyengar reviews relevant school metrics such as new research funding and current grant research activities.
 - b. He discusses efforts to develop numerous centers including Cache and Cyber Security.
 - c. He describes student achievements, new faculty hiring efforts, and the importance of multi-disciplinary efforts for visualization being pursued in ICAVE.
 - d. Mr. Fleck comments that the student recently hired whom he met at the Senior Project Showcase is excellent and is leading projects at Citrix.

- e. Board members remark on teaching students about ethics and software licensing issues. The school does require students to take an ethics course.
- 4. Senior Project/VIP Highlight Presentations (see vip.fiu.edu)
 - a. Students provide details about their projects and receive feedback from Board members:
 - i. FruiTREC
 - ii. NEAT
 - iii. EEVA
- 5. Dr. Sam Ganzfried presents his Game Theory research work. (see materials)
 - a. Dr. Ganzfried provides an intro to Game Theory using various examples.
 - b. He discusses how difficult game simulations are based on the number of permutation of outcomes.
 - c. He discusses his work in solving specific poker problems.
 - d. Board members comment on how his work has application in many fields especially those that require AI techniques.
- 6. Mr. Martinez asks Board members for their feedback.
 - a. Mr. Caraballo comments that the ABET committee was very impressed with our students and the projects they pursue. He believes that the projects have startup impact.
 - b. Mr. Fleck comments that he sees solid progress being made by the school. Citrix is recruiting at FIU successfully. He has introduced our students to CEO. The school has a big success story.
 - c. Mr. Packert states that the work done at the school keeps getting better and better and that the school is not standing still. He comments how the students are learning the new state of the art tools, like Agile, that will make them successful in industry.
 - d. Mr. Silvestre states that the School needs to get the word out about these successes. He challenges Board to get involved and help promote the school.
 - e. Mr. Martinez points out that the University communication group needs to work harder to tell our stories. Also, that inviting companies to take a tour of the school would help.
 - f. Mr. Caraballo agrees and believes more companies should participate in the Senior Project Showcase. The Showcase was moved to evening to accommodate more industry attendance. Other board members comment on the importance of building brand and visibility.
 - g. Mr. Borrás states the school needs to be prepared for the coming industry trends and to be prepared to address with curriculum so that students will be ready for jobs in these areas.
- 7. Mr. Luis discusses potential dates with Board members for the next meeting. The next meeting will align with the next Senior Project Showcase that is Apr. 21st.
- 8. Mr. Martinez makes his final remarks again thanking Board members for attending.
- 9. Mr. Martinez closes the meeting at 7:41pm.

Summary of Board Actions

1. 4/29/11: Board members offer to assist school reach out to local companies to broaden participation in the school development. Terremark and Cruise Lines are suggested as the first companies to approach. School to obtain FIU Foundation approval to begin discussions with these companies. Continue development with incoming Director. 9/16/11: We have Foundation approval to open discussion with RCL. 12/2/12: Foundation has given approval to approach RCL. 4/27/12: Mr. Silvestre will reach out to RCCL for interest to participate on the Board. 9/14/12: Mr. Silvestre

presented two new Board members from RCCL: Max Schmidt and Jose Machado. 12/7/13: Dr. Gerber introduces new Board member Thomas Packert, VP of Information Management, Orthosenor. Board members continue to pursue potential Board member prospects.

Summary of Closed/Tabled Actions

- 1. FL Governor Discussion:** 8/19/05: Mr. Braun has requested Dr. Deng investigate the cost of a study to better understand IT employment attraction and retention issues in South Florida. The study will be used as a basis for a discussion with Florida's Governor, Mr. Braun, Board members and Dr. Maidique/FIU. 12/9/05: The cost for the IT employment study request by Mr. Braun is \$60K. The Board defers this item to Mr. Braun for further discussion. 5/26/06: Board members expressed concern regarding the \$60K needed to conduct the survey. Board members agreed to postpone discussion on action until next Governor takes office.
Board Action: 12/09/05 Tabled, till 2007.
- 2. Industry Center:** 8/19/05: The Board supports the new direction for boot-strapping funding for an industry center by creating an "umbrella" of research projects that members can fund and/or pursue funding joint funding from Federal agencies. The Board requests to be informed with progress in this area. 12/9/05: The school and Board members are having ongoing discussions regarding joint projects and funding opportunities. The LA Grid Program is the outcome of conversations with IBM. The school will update Board members going forward. *Board Action: 12/09/05 Closed*
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Board Action: 12/09/05 Closed
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Board Action: 12/09/05 Closed
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 - It is sufficient for action to be taken on any agenda item by the attending Board members.
 - Actions items accepted by the Board should establish a time limit with the understanding that action should be taken within that time or should be closed.
 - The school will implement these procedures at upcoming meetings.

Board Action: 12/09/05 Closed

- 7. IT Industry Scholarship Fund:** 12/9/06: The Board agreed to review a proposal by Dr. Deng to develop an industry-based funding mechanism for student scholarships to attract high quality students. Dr. Deng will develop the proposal and distribute to Board members as soon as possible. A conference call should be scheduled thereafter to discuss the proposal. 5/25/06: Board members agreed to pursue the Scholarship Fund Campaign. Mr. Luis prepared and distributed materials for Board members to discuss with their colleagues. 04/07: Tabled to obtain more Board member feedback and direction.

Board Action: 12/09/05 Open, pending review

- 8. Business Continuity Information Network:** 12/07: Mr Braun suggests to Board members to reach out to their peers and networks to facilitate support. Board interested in sending letter of support on behalf of Centers of Excellence to lobby Gov. Board. Not pursued due to lobby rule limitations.
- 9. Board Chair:** 9/12/08: Pete Martinez nominated and with a unanimous vote of the Board is elected as Board Chair. Dr. Meleis steps down as Board Vice-Chair. Mr. Martinez to nominate a Vice-Chair. 12/5/08: Dr. Roy Gerber is appointed Board Vice Chair. Closed

- 10. School Move:** 12/4/09: Mr. Gerber receives a motion from the Board to create a draft letter to circulate to the Board member for comment/signature expressing concern for moving the School to the Engineering Center building. A letter was drafted, circulated, signed and delivered to FIU Provost in Dec. 2009. Provost responded by stating that the School's future success is paramount in his decision and that the Board will be consulted before any decisions are made. *Closed.*

- 11. Student Mentoring:** 9/12/08: Mr. Martinez proposes and the Board members agree to support a Student Mentoring program whereby each Board members would become a mentor of a student of the school. Mr. Martinez asks that a list of potential student candidates be drawn up. 12/5/08: Mr. Luis provides Board with resumes of students interested in the Mentoring program via web location of Board Materials. 9/10/10: Mr. Borrás receives first student to mentor. *Ongoing*

- 12. Board Membership:** 8/19/05: The Board has identified 8 companies to pursue for Board membership. The Board has set as a goal to have 15 total members. FIU will work with Mr. Braun to further communicate (via letter/phone) with non-active board members and potential members we

would ask to join. Board members are encouraged to participate in the recruitment process. 12/9/05: Nick Bowen/IBM and Armando Garcia/IBM withdraw from the Board. Pete Martinez is added. Board members agree to pursue 4 additional members. Dr. Meleis will contact Citrix. Pete Martinez will contact Telefonica. Mr. Braun has made initial contact with Global Crossing, requires follow-up. FIU will continue discussions with PBS&J. 5/26/06: Dr. Meleis invited Mr. Cristinziano, Citrix VP, who accepted invitation. Also, Board members agreed that the Board should become larger before developing sub-committees. 12/15/06: Mr. Cristinziano steps down due to relocation. 2/26/07: Conf. Call, two new Board members are introduced, Mr. Pallin and Mr. Buchenhorner, three additional members are begin sought by April Meeting. Membership stands at 12. 4/07: Board affirms that 15 members are sought by next meeting. Dr. Meleis suggested that the Board review the objectives of the Board to assist in identifying additional members to recruit. 9/07: Three new Board members are introduced, Mr. Bravo/Microsoft, Mr. Fleck/Citrix and Mr. Ugale/Crossbow Ventures. Dr. Meleis proposed that the Board finalize objectives and create committees to work on Board objectives. 12/07: Mr. Braun requests further information about the objectives of the school going forward to better align with Board committee development. Item deferred to next meeting. *Board Action: 12/9/05, closed*

- 13. Committees:** 9/12/08: Mr. Martinez proposes and the Boards passes the creation of two committees: Research and Talent Development. The Research Committee will help the school align its resources with Federal, State and local strategic investments and funding opportunities from the private and public sector. The Talent Development Committee will assist the school to develop programs to enhance student research and education experiences, further driving the competitiveness of our students. 12/5/08: Committees to meet via conf. call to formulate goals and actions. *Closed*
- 14. BS in Computer Science Program Educational Objectives and Student Outcomes:** 12/10/10: Dr. Navlakha presented the modified outcomes for the BS-CS program, and the Board unanimously concurred with the suggested modifications. The documents are available with Board materials. **CLOSED**
- 15. CS Senior Projects:** 12/10/10 : Board members request that there be regular presentations from Senior Project students. The dialog is beneficial for both industry and school. Student presentations will be evaluated for Fall and Spring agenda based on quality and relative interest of the board. **CLOSED**
- 16. Technology Transfer Initiative:** 9/10/10: Board members approve of the School's efforts to assist faculty and students accelerate the IP development process by improving licensing options, expediting IP review process, and providing pre-incubator technical and business support. Board members offer to provide further guidance. Mr. Luis to contact Board members with next steps. **CLOSED**
- 17. Collaborative Open Innovation Lab:** 4/29/11: Board members express interest to participate as COIL mentors. Program is awaiting final approval. Mr. Luis to provide information to the Board regarding mentoring opportunity. 9/16/11: Waiting for final approval of program via External Programs/University College. 12/2/11. Mr. Luis updates Board members that the COIL program has started activities. **CLOSED**

- 18. *National Rankings:*** 9/16/11: Board members request to know the key metrics the school is tracking for improving national ranking. 12/2/11: Dr. Iyengar discusses rankings in his presentation. The NRC ranking is not due for another three years. CLOSED
- 19. *Intellectual Property:*** 9/16/11: Board members request to know more about intellectual property/patents efforts in the school. 12/2/11: Dr. Iyengar and Mr. Luis present information about IP at FIU. No further action is requested. CLOSED
- 20.** 12/2/12: Board Members have requested that the School begin tracking where its graduates are finding jobs and report back on findings periodically. 4/27/12: A survey of recent graduates was presented and an Alumni listing which is posted on the website is started. Updates will continue and reports given to the Board periodically. CLOSED.
- 21.** 9/13/13: Conduct an employment survey with 2013-14 graduating seniors. Report findings of survey. Employment Survey presented at 12/02/16 meeting. See materials for details.

INDUSTRY ADVISORY BOARD
Florida International University
School of Computing and Information Sciences

Board Meeting Actions and Summary (DRAFT)

April 21st, 2017

Florida International University

Miami, FL

Board Member Attendance:

- Pete Martinez, IAB Chair, Chairman and CEO, Game Changer Tec, LLC
- Jaime Borrás, CEO, Wireless Silicon Group, and Senior Fellow, Motorola Mobile Devices
- Christopher Fleck, Vice President, Emerging Solutions Citrix
- David Martinez, Associate Head, MIT Lincoln Lab
- Thomas Packert, Chief Information Officer, CareTrader
- Bert Sylvestre, Vice President Business Development, Pro Logic Systems

FIU Representation:

- Dr. Ram Iyengar, Director and Ryder Professor, FIU SCIS
- Dr. Mark Finlayson, Assistant Professor, FIU SCIS
- Dr. Giri Narasimhan, Associate Professor, FIU SCIS
- Col. Jerry Miller, Discovery Lab, FIU SCIS
- Dr. Mario Eraso, STEM Coordinator, FIU SCIS
- Steven Luis, Director of Technology and Business Relations, FIU SCIS

Board Meeting Summary

1. Mr. Martinez begins the meeting at 5:08 pm.
2. Mr. Martinez in his opening statements welcomes Board members and a proceeds to discuss the importance of industry interaction faculty students. He thanks members for their time. He asks members to introduce themselves and he welcomes new board member David Martinez.
3. Dr. Iyengar presents his report to the Board (see materials.)
 - a. Dr. Iyengar presents and update on school metrics including research funding.
 - b. Mr. Pete Martinez comments that Dr. Rosenberg has expressed a strong interest in industry collaboration.
 - c. He outlines numerous awards achieved by faculty members. He provides an overview of anticipated new hires including the new Dean of CEC.
 - d. He describes various outreach and marketing activities of the school.

- e. He provides an overview of the MERIT Lab recently approved by the Provost Office. The new lab will focus on Cyber Security research and education.
- 4. Senior Project/VIP Highlight Presentations (see vip.fiu.edu)
 - a. Students provide details about their projects and receive feedback from board member.
 - b. Mr. David Martinez comments that students giving presentation are asking graduate level questions.
- 5. Dr. Giri Narasimhan presents the MS in Data Science program.
 - a. Dr. Narasimhan cites evidence of the growing demand for the the MS DS program.
 - b. He discusses FIU's approach of building an interdisciplinary program that engages multiple colleges in 4 major areas.
 - c. He reviews the admissions requirements, curricular requirements, course sequence, capstone project, and key learning objectives.
 - d. He lists current industry partners and potential for the program growth.
- 6. Mr. Martinez asks Board members for their feedback.
 - a. Mr. Pete Martinez encourages the school to continue to reach out to Industry to participate in the Senior Project mentoring.
 - b. Mr. Sylvestre comments on the growth of managed services and how the school can leverage them for research and instruction.
 - c. Mr. David Martinez points out that the DoD agencies are looking for talent and our school should expand engagement in that area.
 - d. Mr. Pete Martinez suggests that the school should promote the MS in Data Science program by developing a panel program to invite companies to participate.
 - e. Mr. Packert discusses how different disciplines are using data engineering techniques to bring data together in new ways and how this represents an opportunity for the school.
 - f. Mr. Borrás states that he was "blown out of the water" by the student presentations. He states that they have risen the bar from what has been seen before. He further adds that he is happy to see the new master's program. He points out that the most popular course in MIT is machine learning now.
 - g. Mr. Packert comments that he continues to see advancement in the schools initiatives. He "loves the cyber initiative" and notes that the demand for students in this area is there. He comments on the need to further scale up the program enrollment to meet local demand for talent.
 - h. Mr. Fleck points out that FIU has an opportunity to prove the critics wrong that there is a world-class program developing in SFL to generate AI/machine learning talent.
 - i. Mr. David Martinez is very impressed with the students, their depth of knowledge. He suggests we have differentiated ourselves by having students focus on hands-on learning, and that requires them to develop their communication skills and confidence.
 - j. Mr. Sylvestre states that by blending both business and science together for the program will make it successful. He feels the school is ahead of the curve. The challenge will be to find enough talent in the local area.
- 7. Mr. Luis discusses potential dates with Board members for the next meeting. The next meeting will align with the next Senior Project Showcase that is Dec. 1st.
- 8. Mr. Martinez makes his final remarks again thanking Board members for attending.
- 9. Mr. Martinez closes the meeting at 8:18pm.

Summary of Board Actions

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APPENDIX J: Examples of Learning Outcomes

CDA 3103 Fundamentals of Computer Systems

Course Outcomes:

1. Master the representations of numeric and character data
2. Master the implementation of some basic combinational circuits, registers and memories
3. Be familiar with the data path of a simple von Neumann architecture and its relation to the instruction execution cycle
4. Master simple machine and assembly language programming
5. Master the implementation of high-level language constructs in lower levels: selection, iteration, function call/return

Learning Outcomes:

- 1.1 Derive and interpret the two's-complement representation of signed integers
- 1.2 Derive and interpret at least one representation of real numbers, e.g. IEEE Short Real
- 1.3 Interpret the representation of character data in some standard format, e.g. ASCII

- 2.1 Demonstrate the effect of NOT, AND, OR and XOR operations on binary data
- 2.2 Analyze a simple circuit using fundamental building blocks
- 2.2 Characterize the operation of the decoder, multiplexer, adder and simple memory circuits

- 3.1 Describe the organization and components of a simple von Neumann architecture
- 3.2 Demonstrate the implementation of simple machine language instructions using register transfer notation

- 4.1 Write programs in machine and assembly language employing flow-of-control and subroutine call and return constructions
- 4.2 Describe the operation of a simple 2-pass assembler

- 5.1 Demonstrate how conditional operations and transfer of control are implemented at the machine level
- 5.2 Demonstrate how parameters are passed to subroutines and how local workspace is created and accessed at the assembly language level

COP 4710 (COP 4540) Database Management

Course Outcomes

1. Be exposed to information systems
2. Be familiar with database system and database architecture
3. Master the design conceptual schemas
4. Master normalization theory and the mapping of a conceptual schema to a relational schema
5. Master the expression of queries in SQL, relational algebra, and relational calculus
6. Be familiar with physical database design
7. Be familiar with writing application programs that use SQL

Learning Outcomes

- 1.1 Explain basic information storage and retrieval concepts
- 1.2 Describe issues of information privacy, integrity, security and preservation

- 2.1 Describe the goals, components and functions of a database system
- 2.1 Explain the concept of data independence and its importance in a database system

- 3.1 Characterize the various data models
- 3.2 Design the conceptual schema for a database

- 4.1 Prepare a relational schema from a conceptual model

- 5.1 Demonstrate queries in relational algebra using union, intersection, difference, and Cartesian product operations
- 5.2 Demonstrate queries in tuple relational calculus, domain relational calculus, and SQL

- 6.1 Evaluate functional dependencies between two or more attributes in a relation

- 7.1 Describe database queries (insert, update, retrieve, and delete) using SQL statements