



**COMMITTEE ON ACADEMIC PLANNING AND REVIEW
ANNUAL PROGRAM REPORT**

College	CoS
Department	Math and Computer Science
Program Unit	Computer Networks
Reporting for Academic Year	2013-2014
Department Chair	Matt Johnson Report by Leann Christianson
Date Submitted	6/30/2014

1. SELF-STUDY (about 1 page)

A. Five-year Review Planning Goals

The Master degree program in Computer Networks is unique, as no other local university offers a similar degree. Faculty members supporting this program also support the Computer Science program. Additionally, all courses (except the Capstone) can be potentially dually enrolled with MS Computer Networks and MS Computer Science students. This makes assessment of both programs challenging. Students participating in the Computer Networks program are very successful in finding employment, and the attrition rate is minimal.

Our goals from the last 5 year review were to increase enrollment in the program, replace retiring faculty, and to implement an assessment plan. In regards to enrollment, we have seen a steep 100% increase of applicants to the program. With computer science also seeing a 250% increase, we have been having trouble offering enough sections of our courses. The department was able to hire one new faculty member, Fay Zhong to teach Computer Science theory. We have another search this year for a general computer scientist with knowledge in topical areas such as big data, application development, or cloud computing.

Our assessment plans have been moving forward. We have mapped institutional learning outcomes to program and student learning outcomes. We have aligned EACH of our courses with program learning outcomes. We have implemented assessment in five key courses in our M.S. Computer Science program, including most notably the Capstone Experience. We are compiling results and modifying our process as we further develop our assessment model.

The Program Prioritization report was in fact somewhat useful as a self-study, and we have pinpointed several areas for improvement in our assessment plan, and in meeting institutional learning outcomes.

B. Five-year Review Planning Goals Progress

In our five year review we mentioned the need to increase enrollment, replace faculty that were FERPing or retiring, and institute an assessment plan. The demand for the Computer Network degree is primarily external and based on location and employment opportunities. Students from other countries make up the majority of our population. They come because the university is so near to Silicon Valley. We also attract currently employed networking professionals who wish to increase their knowledge and promotion opportunities. The economic upturn and the need for networking professionals have increased job opportunities. Consequently, we are seeing a marked increase of applicants. (See data below). Students are getting hired quickly, and employers are contacting our department regularly. The Bureau of Labor statistics projects a 22% increase in jobs over the next 6 years.

Six faculty members in the Computer Networks program are FERPing. It is essential to replenish faculty to both cover existing requirements and find faculty with more direct experience with newer technology. We have difficulties hiring Computer Science lecturers due to salary constraints and opportunities in Silicon Valley. Luckily, we were able to hire a new tenure track faculty member and anticipate hiring another tenure track faculty member this year.

At the time of our last five year review, we were just starting to identify program learning outcomes and student learning outcomes. In the past two years we have finalized program learning outcomes, aligned those to our courses, and have begun implementing post-assessment examinations for each course. The exams are deployed through Blackboard and automatically scored. We are looking at ways to streamline this process, most notably for the Capstone Project course (CS 6899) and the Communications Network Analysis and Design course (CS 6591) which is required for all students in the Computer Networks program. The Capstone Projects are assessed through a separate reading.

C. Program Changes and Needs

Since our last five year review, two new hybrid courses have been added to the Computer Networks curriculum: Security in Mobile, Wireless, Grid and Pervasive Computing (CS 6526) and Security Management (CS 6527). These are courses that Computer Science students often take as well. Proposals have been submitted for graduate Computer Science courses in Statistical Machine Learning and in Software Testing.

Faculty Data:

Name	Base
Billard, Ted	0.11 (FERP)
Brown, Kevin	1.0
Christianson, Leann	1.0
Daley, Jim	0.22 (FERP)
Ertaul, Levent	1.0
Grewe, Lynne	1.0
Johnson, Matt	1.0
Jurca, Dan	0.44 (FERP)
Reiter, Eddie	0.5 (FERP)
Roohparvar, Farzan	1.0
Simon, Steve	0.44 (FERP)
Thibault, William	1.0
Yang, David	1.0

Yu, Ytha	0.5 (FERP)
Zhong, Fay	1.0
Total:	11.21

Resources and Needs:

The Computer Science Department was dramatically impacted by IT Centralization several years back. Up until last year, we had only one computer classroom. We have a small distributed systems research lab called compCore run by Dr. Thibault, in which a maximum of five students can work. Dr. Brown has a dedicated switch which used for his network management course. This year we were finally able to obtain at least primary usage to a second newly renovated computer classroom, and access to a second small computer lab in VBT. CS is still SEVERELY underequipped. Students often try to make do with their own laptops and general purpose space (like the Cave of the Science building), but this often leads to difficulties from incompatibilities among their laptops. Many courses in the curriculum require dedicated servers that are isolated from the campus networks, as students write programs to interact or query these servers. Getting these configurations set up is difficult when IT centrally manages all systems on campus. Classroom space, retiring faculty, equipment and software shortages, and lack of dedicated IT support are all issues that impact the program's future growth.

2. SUMMARY OF ASSESSMENT (about 1 page)

A. Program Student Learning Outcomes

Students graduating with an M.S. in Computer Science from CSU, East Bay will be able to:

1. Exhibit mastery of advanced computer science theory as applied to the field of computer networks
2. Employ current techniques, skills, tools, and coding practices necessary for application and system development
3. Apply critical thinking and problem solving skills by analyzing problems, designing solutions, and evaluating results
4. Demonstrate communication skills in both written and oral form, and work in a team environment
5. Independently acquire new computer related skills through analysis of current computer science literature and industrial practices

B. Program Student Learning Outcome(s) Assessed

All learning outcomes were assessed in the following courses:

CS 6526 Practicing PLO 1, PLO 4, and PLO 5	
CS 6591 Practicing PLO1 and PLO2, Mastering PLO 4	
CS 6715 Mastering PLO 1, Practicing PLO 3 and PLO 4	(Breadth requirement)
CS 6899 (Capstone Project), Mastering PLO 3, PLO 4, PLO 5	(Capstone requirement)

C. Summary of Assessment Process

We created PLO's and SLO's for the Master's in Computer Networks in the academic year 2012-2013. The Math/Computer Science Department in which this degree is housed made the

decision to use Blackboard as a means to provide students with an assessment exam that addresses the SLO's of each course which are mapped to PLOs for each program and the ILO's of the university. We have these in place for four courses in the MS Computer Networks program at this time. The results of these exams are being stored in a separate Blackboard shell repository for the Department. Evaluating the results of these exams is challenging, as each assessment contains questions for multiple PLO's. We are currently looking at averages over the entire exam which is suboptimal. To evaluate by PLO hand calculations are needed.

Due to this, we are considering other options such as creating individual assessments for each PLO thus allowing automatic calculation through Blackboard. Another challenge is addressing PLOs for both the Computer Science Master's degree and the Computer Network Master's degree in courses that serve both programs.

This year we will add a second reading of Capstone projects by a team that does not include the instructor of the course. Capstones will be scored as "Exceeds", "Meets", or "Does Not Meet" for PLOs 3-5. A rubric will be developed in the next year that can be imported into Blackboard. We will also hope to complete assessments for the remaining courses in the program (6580, 6560, 6594, 6527, 6320, and 6522).

In evaluating our PLO's and SLO's and their correspondence to the ILO's, we note that diversity, social responsibility, and sustainability are not adequately addressed in our curriculum. We plan to incorporate these areas in two required courses: CS 6899 Capstone Project and CS 6591 Communications Network Analysis and Design. Our goal for this modification will be 2015. Future work will include the review of student outcomes, tuning of questions that address the PLOs, and modification of the curriculum in an effort to improve student results.

D. Summary of Assessment Results

CS 6526	average score 80%
CS 6560	average score 78%
CS 6596	average score 97%
CS 6715	average score 60%
Capstone evaluation in progress	

3. STATISTICAL DATA

All data available at <http://www20.csueastbay.edu/ir/academic-program-review/>

Student Demographics:

CAPR Table 1

California State University, East Bay

Computer Network		Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Female	Black, non-Hispanic		1			
	Asian		3		1	
	White				1	
	Race/ethnicity				1	3

	unknown					
	Nonresident aliens	6	10	15	14	16
Male	Black, non-Hispanic				1	1
	Asian				1	3
	White	2	1			2
	Race/ethnicity unknown		1			
	Nonresident aliens	15	19	10	7	28
Total	Black, non-Hispanic		1		1	1
	Asian		3		2	3
	White	2	1		1	2
	Race/ethnicity unknown		1		1	3
	Nonresident aliens	21	29	25	21	44

Annual Data:

A. Student Headcount:

Computer Network		Fall Quarter				
Headcount Enrollment		2009	2010	2011	2012	2013
<i>Computer Network</i>						
1. Undergraduate		0	0	0	0	0
2. Postbaccalaureate		0	0	0	0	0
3. Graduate		23	35	25	26	53
4. Total Number of Majors		23	35	25	26	53

B. Degrees Awarded:

Computer Network		College Years				
Degrees Awarded		08-09	09-10	10-11	11-12	12-13
1. Undergraduate		0	0	0	0	0
2. Graduate		0	5	12	16	12
3. Total Number of Majors		0	5	12	16	12

C. Faculty Information:

Please note that the university does not calculate separate data for the Math and Computer Science programs.

Please see above (Program Needs) for information on Computer Science and Computer Network faculty.

CS, Computer Networks and Mathematics		Fall Quarter				
Faculty		2009	2010	2011	2012	2013
Tenured/Track Headcount		Computer Science, Computer Network, and Mathematics				
1. Full-Time		28	25	25	23	21
2. Part-Time		3	4	2	1	1
3a. Total Tenure Track		31	29	27	24	22
3b. % Tenure Track		57.4%	80.6%	62.8%	58.5%	52.4%
Lecturer Headcount		Computer Science, Computer Network, and Mathematics				
4. Full-Time		3	1	1	1	2

5. Part-Time	20	6	15	16	18
6a. Total Non-Tenure Track	23	7	16	17	20
6b. % Non-Tenure Track	42.6%	19.4%	37.2%	41.5%	47.6%
7. Grand Total All Faculty	54	36	43	41	42
Instructional FTE Faculty (FTEF)	Computer Science, Computer Network, and Mathematics				
8. Tenured/Track FTEF	19.5	22.4	19.4	16.5	17.4
9. Lecturer FTEF	21.5	11.1	18.1	19.0	19.3
10. Total Instructional FTEF	41.0	33.5	37.4	35.4	36.7
Lecturer Teaching	Computer Science, Computer Network, and Mathematics				
11a. FTES Taught by Tenure/Track	372.5	439.1	307.1	288.1	314.9
11b. % of FTES Taught by Tenure/Track	37.8%	58.7%	38.7%	36.0%	36.2%
12a. FTES Taught by Lecturer	612.5	308.5	487.1	513.2	553.9
12b. % of FTES Taught by Lecturer	62.2%	41.3%	61.3%	64.0%	63.8%
13. Total FTES taught	985.0	747.7	794.2	801.3	868.7
14. Total SCU taught	14775.0	11215.0	11913.0	12019.0	13031.0

D. Student Faculty Ratios:

Computer Science and Networks	Fall Quarter				
Student Faculty Ratios	2009	2010	2011	2012	2013
1. Tenured/Track	17.8	16.8	14.7	17.1	19.4
2. Lecturer	22.3	26.4	23.6	27.5	30.2
3. SFR By Level (All Faculty)	18.8	17.5	15.5	18.5	21.5
4. Lower Division	26.7	24.6	22.5	20.8	24.9
5. Upper Division	18.0	17.0	17.5	20.2	21.4
6. Graduate	16.6	15.9	10.1	14.5	19.8

E. Sections:

Computer Science and Networks	Fall Quarter				
Section Size	2009	2010	2011	2012	2013
1. Number of Sections Offered	47.0	39.7	47.8	37.0	45.8
2. SCU taught	3505.0	3016.0	2962.0	3054.0	3938.0
3. Average Section Size	20.6	21.1	17.8	20.9	22.5
4. Average Section Size for LD	31.0	33.5	26.4	29.5	27.0
5. Average Section Size for UD	19.2	20.2	18.8	21.4	22.9
6. Average Section Size for GD	18.3	18.7	12.5	15.5	19.5
7. LD Section taught by Tenured/Track	4	4	5	5	5
8. UD Section taught by Tenured/Track	19	18	21	19	21
9. GD Section taught by Tenured/Track	13	16	18	10	12
10. LD Section taught by Lecturer	2	0	2	1	3
11. UD Section taught by Lecturer	6	1	0	3	5
12. GD Section taught by Lecturer	4	2	3	3	3