



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

College	CoS
Department	Math 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’s degree program in Computer Networks is unique as no other local university offers a similar degree. Faculty supporting this program also support the Computer Science programs. 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 our institutional learning outcomes to program and student outcomes. We have created a grid of program courses and how they meet program learning outcomes. We have implemented assessments in five of our courses, most notably the Capstone project. These are done through Blackboard. We are compiling results and modifying our process as needed.

The priority and distinction report was 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 as well. 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 finding internships easily. Employers are contacting our department regularly. The Bureau of Labor statistics projects a 22% increase in jobs over the next 6 years.

Six faculty in the Computer Science 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 getting started identifying program learning outcomes and student learning outcomes that map to the institutional learning outcomes. In the past two years, we have finalized program learning outcomes, mapped those to our courses and have begun implementing assessments for each course, most notably 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. Assessment is in the form of quizzes that address each particular learning outcome. The quizzes are deployed through Blackboard and automatically scored. We are looking at ways to streamline this process. 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)

Faculty Data – note data is for all Computer Science Faculty as they all teach in the Computer Networks program.

Institutional Research:

Tenured/Tenure Track FTEF = 17.4

Total FTEF = 36.7

Ratio =  $17.4/36.7 = 47\%$

Name	Time Base
Brown, Kevin	1.0
Christianson, Leann	1.0
Ertaul, Levent	1.0
Grewe, Lynne	1.0
Johnson, Matt	1.0
Jurca, Dan	0.5 (FERP)
Reiter, Eddie	0.5 (FERP)
Roohparvar, Farzan	1.0

Simon, Steve	0.5 (FERP)
Thibault, William	0.5 (FERP)
Yang, David	1.0
Yu, Ytha	0.5 (FERP)
TOTAL	9.5

#### Resources and Needs:

Our student lab, half the Math/CS office space, xerox machine, and IT person were eliminated over the past year. 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. The College of Science provides smart rooms, however, the program and department as a whole does not have a student computer lab. This is a big problem as students need a place that allows them to work together. It would also be very advantageous to have a small lab in which students could practice loading and installing software, and experimenting with network configurations and metrics. Many courses in the curriculum require dedicated servers that are isolated from the campus network. 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, limited staff, equipment, software, and IT support, are all issues that impact the program's future growth.

## **2. SUMMARY OF ASSESSMENT (about 1 page)**

### **A. Program Student Learning Outcomes**

Program Student Learning Outcomes (PLO's):

Students graduating with an M.S. or M.A. in Computer Networks 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:

CS 6899 (Capstone Project), Mastering PLO 3, PLO 4, PLO 5

CS 6591 (Communications Network Analysis and Design) Practicing PLO1 and PLO2, Mastering PLO 4

CS 6715 (Data Compression – Breadth Course) Mastering PLO 1, Practicing PLO 3 and PLO 4

CS 6526 (Security in Mobile, Wireless, Grid and Pervasive Computing) Practicing PLO 1, PLO 4, and PLO 5

### **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**

2013-2014	Exam results
CS 6526 -	average score 80%
CS 6560 -	average score 78%
CS6596	average score 97%
CS 6715	average score 60%

Capstone evaluation – in progress

### 3. STATISTICAL DATA (about 1 page)

Planning and Institutional Research produce program statistics annually in standard format. These statistics will be attached to the Annual Report of the Program Unit. This statistical document is expected to be approximately one page long and will contain the same data as required for the five-year review including student demographics of majors, student level of majors (e.g. Juniors, Seniors), faculty and academic allocation, and course data.

The following links might be helpful:

a) Student demographics of majors

<http://www.csueastbay.edu/ira/factbook/capr%20enrollment%20by%20pgm%20major.html>

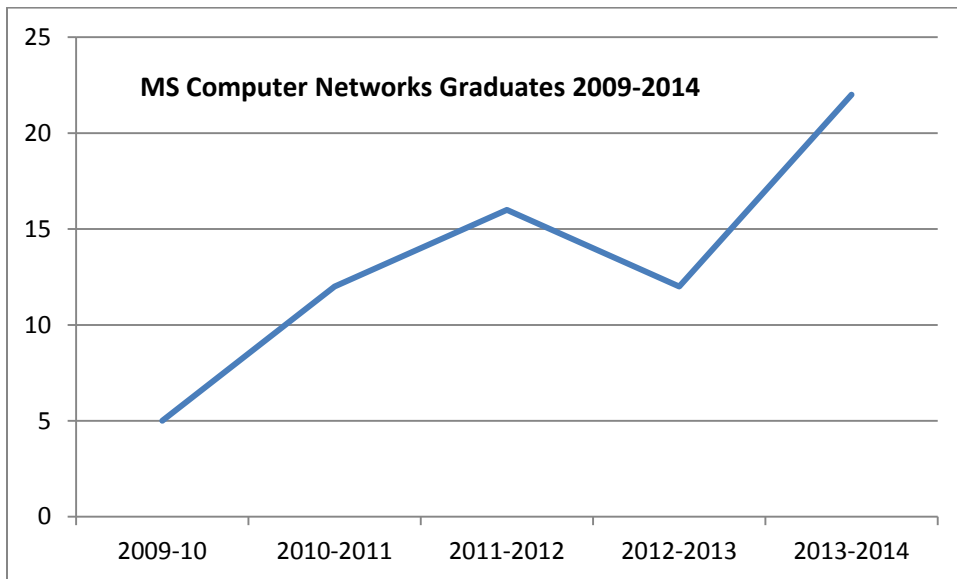
**CAPR Table 1**

**California State University, East Bay**

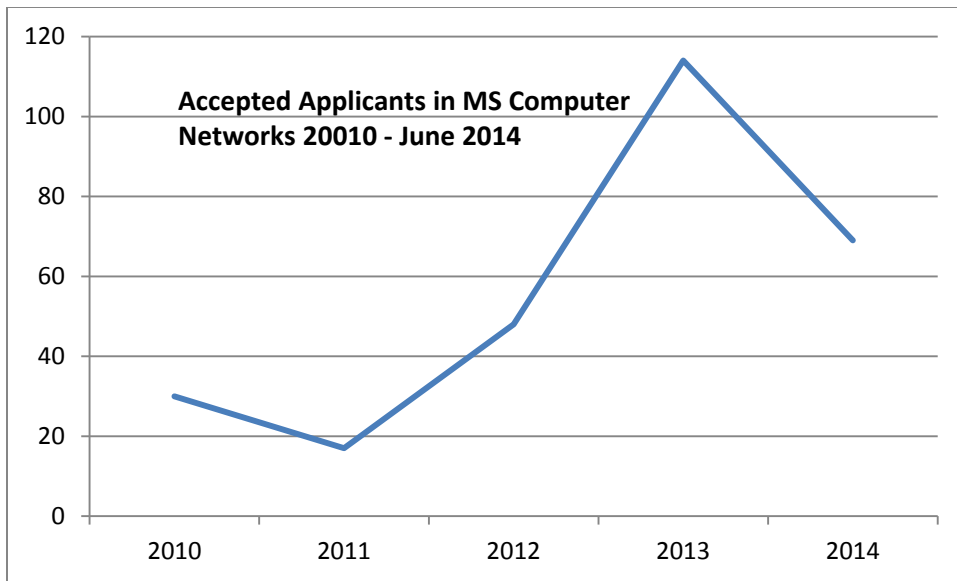
Computer Network		Fall 2009		Fall 2010		Fall 2011		Fall 2012		Fall 2013	
		Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL
		Master		Master		Master		Master		Master	
Female	Black, non-Hispanic			1	1						
	Asian			3	3			1	1		
	White							1	1		
	Race/ethnicity unknown							1	1	3	3
	Nonresident aliens	6	6	10	10	15	15	14	14	16	16
Male	Black, non-Hispanic							1	1	1	1
	Asian							1	1	3	3
	White	2	2	1	1					2	2
	Race/ethnicity unknown			1	1						
	Nonresident	15	15	19	19	10	10	7	7	28	28

Computer Network		Fall 2009		Fall 2010		Fall 2011		Fall 2012		Fall 2013	
		Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL	Degree Level	TOTAL
		Master		Master		Master		Master		Master	
	International students										
Total	Black, non-Hispanic			1	1			1	1	1	1
	Asian			3	3			2	2	3	3
	White	2	2	1	1			1	1	2	2
	Race/ethnicity unknown			1	1			1	1	3	3
	Nonresident international students	21	21	29	29	25	25	21	21	44	44

b) Degrees Conferred by the program



Accepted Applications for MS Computer Networks – Data is from Graduate Coordinator records.



**\*Note that we are still taking applicants for 2014 - figure does not include July-Dec 2014**

c) SFR's by discipline

Below is SFR data for Computer Science – we cannot pull apart distinct data for Computer Networks as all faculty teach in both programs.

<b>Tenu red &amp; Tenu re Trac k</b>	257 1.0	270 0.0	258 4.0	244 8.0	287 2.0	171 .40	180 .00	172 .27	163 .20	191 .47	9.6 2	10. 71	11. 71	9.5 6	9.8 6	17. 82	16. 80	14. 71	17. 07	19. 42
<b>Lect urer</b>	934 .0	316 .0	378 .0	606 .0	106 6.0	62. 27	21. 07	25. 20	40. 40	71. 07	2.8 0	0.8 0	1.0 7	1.4 7	2.3 6	22. 25	26. 37	23. 62	27. 52	30. 18
<b>Low er Divis ion</b>	744 .0	536 .0	740 .0	708 .0	834 .0	49. 60	35. 73	49. 33	47. 20	55. 60	1.8 6	1.4 5	2.2 0	2.2 7	2.2 3	26. 68	24. 59	22. 48	20. 83	24. 89
<b>Uppe r Divis ion</b>	170 2.0	132 0.0	146 6.0	156 0.0	196 4.0	113 .47	88. 00	97. 73	104 .00	130 .93	6.3 1	5.1 8	5.6 0	5.1 6	6.1 3	17. 98	16. 98	17. 45	20. 17	21. 35
<b>Grad uate</b>	105 9.0	116 0.0	756 .0	786 .0	114 0.0	70. 60	77. 33	50. 40	52. 40	76. 00	4.2 5	4.8 8	4.9 8	3.6 1	3.8 5	16. 62	15. 86	10. 11	14. 52	19. 76
<b>Total</b>	350 5.0	301 6.0	296 2.0	305 4.0	393 8.0	233 .67	201 .07	197 .47	203 .60	262 .53	12. 42	11. 51	12. 78	11. 03	12. 21	18. 82	17. 47	15. 45	18. 46	21. 50

Math/Computer Science Department/School SFR as compared to the College SFR.



As of fall 2012, the department's SFR was 22.61 for all faculty members, including lecturers.

The College of Science SFR was reported as 26.82

The ratio is  $22.61/26.82 = 84\%$

d) Course History data

Courses for the Computer Network program are offered under the CS prefix and are mixed in with the CS course history. To summarize, Computer Science and Computer Network upper division sections have been increasing since 2011.