



2015-2016 CSCI EETF Assessment Year End Report, June, 2016

Program Name(s)	EETF Faculty Rep	Department Chair
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[NOTE: Items A, B, C, and D are identical to your Page 2 on your Annual Report for CAPR. Please simply cut and paste from there. Item E is unique to the CSCI EETF.]

A. Program Student Learning Outcomes

Students graduating with an M.S. 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

As according to our assessment plan, we are closing the loop on PLO #3 this year. The department does collect assessment data for all targeted courses each year so as to track trajectories for scores on all PLOs.

Post-assessment quizzes were administered for five courses:

- | | |
|---|------------------------|
| CS 6560 Mastering PLO1, Practicing PLO3, PLO4 | (Core requirement) |
| CS 6525 Mastering PLO 1, Developing PLO 4, and PLO 5 | (Breadth requirement) |
| CS 6596 mastering PLO1, Developing PLO2 and PLO3 | (Breadth requirement) |
| 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 PLOs and SLOs for the Master in Computer Networks in the academic year 2012-2013. The 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 SLOs of each course (which are mapped to PLOs for each program and the ILOs of the university). We have these in place for seven courses in the M.S. 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 PLOs. We are currently looking at averages over the entire exam, which is suboptimal. To evaluate by PLO, hand calculations are needed. For the Capstone project, we are using a rubric for evaluating written projects.

As we move to semesters, we again use Blackboard, but we will assess one PLO only in each course which will simplify evaluating results. In evaluating our PLOs and SLOs and their correspondence to the ILOs, we note that diversity, social responsibility, and sustainability are not adequately addressed in our curriculum. We include these areas in our new classes that are tailored towards the semester calendar.

We evaluated PLO #3 in the following courses: CS 6560, 6596, 6715, and 6899. PLO #3 states: Apply critical thinking and problem solving skills by analyzing problems, designing solutions, and evaluating results.

In regards to closing the loop and using the results of the assessment process to improve student learning for PLO #3, it would appear that CS 6560 needs fine tuning

CS 6560 – Operating Systems

This required course in Operating Systems Design addresses material which has a well-defined core of material but is constantly being enhanced by new research and advances in the industry. It clearly maps to both parts of PLO #3, in applying emerging technologies, and requiring advanced knowledge of algorithmic design. While perhaps two thirds of the course material is necessary for all students in the program, the remaining concepts may be presented through a number of avenues. Study of existing commercial operating systems, review of seminal research papers, and creation of software artifacts may all provide opportunities for learning the desired concepts. All of these avenues are included in the current incarnation of the course, with some students finding one or another more useful in providing a grasp of the necessary ideas. The instructor regularly selects or removes research papers for review as they prove more or less

successful in delivering the needed material. Programming assignments are also modified or enhanced as required. This sort of fine tuning may provide for even better student success.

CS 6596 Wireless and Mobile Architecture

This course covers wireless network architectures including cellular, WLAN, and satellite systems. Signal propagation models and reception techniques. Mobile computing issues including location management, routing, transport, and mobile application design. Students are required to implement three projects which simulate mobile units and issues such as handoff and locations discovery. Students average 86% for PLO#3 which indicates that the instructor is doing a good job meeting that particular PLO.

CS 6715 Data Compression

This course covers the basic algorithms in data compression. Student start with markov models and lossless compression and move on to lossy compression and algorithms such as JPEG and MPEG. To address PLO #3, students are required to complete a programming project in which they create their own compression algorithm based on what they have learned and the data they are given. Participation was minimal for the assessment due to the instructor forgetting to offer and extra credit incentive. Results were below average for this class which indicates a need to address design and implementation in more detail. The instructor will focus on these elements in the coming year.

CS 6899 Capstone Project

In the Capstone project, students work in groups of two to complete an implementation of a project. This Winter the teams created location aware applications. Students are required to create a working prototype and give a presentation on their application. Students must also submit a written project in the form of a journal article. Regarding PLO#3, 70% of the students exceeded or met standards for the PLO. Five papers were chosen to be published by refereed journals:

ICWN16

- Implementation of EAX Mode of Operation within a Real-Time Android Chatting Application
- Levent Ertaul, Nikhitha Vadla Konda, Dharani G Ramasamy
- Implementation of Authenticated Encryption Algorithm Offset Code Book (OCB)Levent Ertaul, Sravya K L, Nagaraju Sanka
- Implementation and Performance Analysis of PBKDF2, Bcrypt, Scrypt

AlgorithmsLevent Ertaul Manpreet Kaur, Venkata Arun Kumar R Gudise

Proceedings of the 2015 International Conference on Security & Management SAM'16

- Performance Comparison of AES-CCM and AES-GCM Authenticated Encryption Modes
Levent Ertaul, Anup Mudan, Nausheen Sarfaraz
- EasyAuth – Implementation of a Multi-Factor Authentication Scheme based on Sound, Fingerprint and One Time Passwords (OTP)
Levent Ertaul, Ishita Thanki

D. Summary of Assessment Results

CS 6560	88%
CS 6596	83%
CS 6715	62% (note only 50% responded)
CS 6899	70%

E. Suggestions and Recommendations for the CSCI EETF in the Future

NONE