



EECS Instructional Computing - Review and Plans Fall 2015 / Spring 2016

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Strategic Goals

Increase our support of services that directly affect the instructors and students. Reduce our time spent on computer hardware maintenance, within existing budget limits. Develop WEB-based and other resources to provide new services quickly and to increase staff efficiency. Consider virtualization of servers, enable student-owned computers.

Implementation:

- Continue lab upgrades (105 Cory, 200 SDH).
- Virtualize servers, such as autograders and print spoolers. Consider ESXi, OpenStack, UCB VPS, AWS, Azure, etc.
- Virtualize desktops, provide VM images for students.
- Help instructors to integrate the "dialtone" services (as defined by the [CNIL committee](#)) such as bCourses, Piazza, Github, Gradescope and Moss
- Evaluate department support for a plagiarism checker.
- Evaluate department support for an autograder such as GradeScope.
- Enable CalNet authentication and authoring tools for course WEB sites.
- Enable student-owned computers in our labs (provide access to printers).
- Simplify the management of computer accounts and cardkey access.



Priorities

- 1) 105 Cory: renovate like 330 Soda (tables, network, carpet) (\$40K)
- 2) 200 SDH: need replacement plan for 30 MacPros (CS10, DeCals) (~\$90K)
- 3) Icluster: need replacement plan for 26 cluster nodes (Dell 1950s); used for Mapreduce, Synopsys, MarkLogic (CS61A, CS250, EE241); 7 years old, although new RAM and disk have been added (~\$60K). These servers are good candidates for virtualization if we can contain the possible costs.
- 4) Virtualization: support for backend servers and VMs for students
- 5) Look for cost savings, define possible Miscellaneous Student Fees.

Recent Improvements

Highlights:

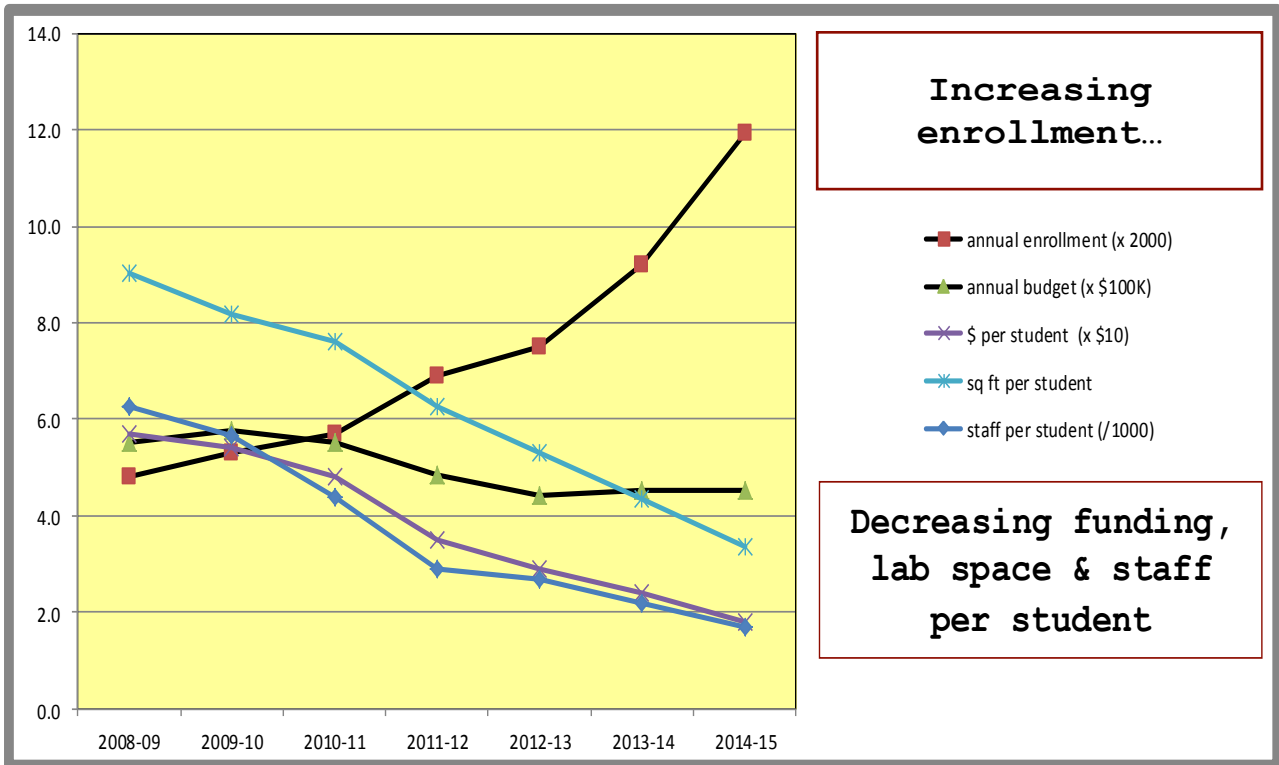
- 1) Renovated 330 & 349 Soda, which completes the 2-year renovation plan for the Soda instructional labs. In addition the department built an upper division collaboration space in 337 Soda
(<http://inst.eecs.berkeley.edu/~inst/3xxSoda/3xx-Soda-Renovation-Proposal.pdf>)
Since Spring 2013, we have upgraded nearly all of the workstations in EE and CS labs and the related servers. This was possible because of increased spending by the department on these facilities as well as generous grants from TI, Intel, SanDisk and Yahoo. It has corrected many problems that became critical following the severe budget cuts in 2008/2009.
- 2) Won grant for Intel Data Sciences Cluster, now running JupyterHub server for new Data Sciences curriculum (CS8/Stat8/Info8 and the related L&S connector courses), successful collaboration with L&S.
- 3) Increased use of virtualization: Solaris zones; ESXI hypervisor; serving VMs for course WEB sites, repositories and autograding. Installed a virtual machine hypervisor (currently ESXi) for rapid deployment of servers for specific classes (CS162, CS186); provided a virtual machine image for instructors to distribute to their students (CS61B).
- 4) Upgraded Instructional LDAP servers to openLDAP: more stable and faster than last year. This corrected the problems we had in Fall 2014.
- 5) Hosting a download site for all campus users to get new NI site licenses.
- 6) 200 SDH Mac lab: Installed 3-screen AV for desktop and laptop projection.
- 7) Enabled on-line (paperless) computer account registration. This goal was partially achieved in August 2015 with the successful distribution of accounts by email to over 1500 CS61A students. In January 2016, all students will obtain their EECS instructional accounts by logging into an EECS WEB site with their Calnet IDs.



Budget Limitations

Our IT funding does not increase when enrollments increase:

- Since 2009, EECS course enrollments have increased by 43%
- Funding per student has decreased by 57%
- Staffing per student has decreased by 65%
- Lab space per student has decreased 52%



	annual enrollment (x 1000)	annual enrollment (x 2000)	annual budget (x \$100K)	\$ per student (x \$10)	ISG IT staff	staff per student (/1000)	lab space (sq ft)	sq ft per student
2008-09	9.6	4.8	5.53651	5.7	6	6.3	17327	9.0
2009-10	10.6	5.3	5.76364	5.4	6	5.7	17327	8.2
2010-11	11.4	5.7	5.53651	4.8	5	4.4	17327	7.6
2011-12	13.8	6.9	4.83183	3.5	4	2.9	17327	6.3
2012-13	15.0	7.5	4.42038	2.9	4	2.7	15962	5.3
2013-14	18.4	9.2	4.52048	2.4	4	2.2	15962	4.3
2014-15	23.9	12.0	4.52048	1.8	4	1.7	15962	3.3



Mission Statement

The EECS Instructional Support Group (ISG) installs and maintains networked computers that are used by EECS classes. ISG provides computer accounts for instructors and students in the Instructional labs and on Instructional servers. ISG purchases, installs and maintains application software needed for classes. ISG supports instructional labs in Cory Hall, Soda Hall and Sutardja-Dai Hall.

ISG wishes to anticipate and meet the computing needs of instructors and students in EECS courses and to provide support for new and innovative learning environments. We wish to be accessible and responsive to requests for service. We also wish to learn about new and interesting technologies that may be of value in this service.

Organizational Scope

The major, ongoing responsibilities of ISG are to manage:

- ▶ computer accounts for 9000+ students in 100+ classes each semester on the EECS instructional computers; cardkey access to the labs
- ▶ systems administration of Windows, Linux, Solaris and MacOSX operating systems and application software, including licensing and security
- ▶ servers for email, WEB, SVN, LDAP, Netshow, autograding
- ▶ 180 desktop computers in 7 CS labs (Soda Hall, Sutardja Dai Hall)
- ▶ 150 desktop computers in 8 EE labs (Cory Hall)
- ▶ 80 compute servers in 4 clusters (Icluster*, Bcom*, Hpse*, Wserver*)
- ▶ 12 compute servers (Ubuntu, Solaris) for CS lower division classes
- ▶ dynamic allocation of additional servers as needed for classes
- ▶ customized software support for instructors and student projects
- ▶ physical condition of 10 computer labs

These are functions in which ISG interacts with other UCB support groups:

- ▶ we use EECS department services (IDSG) for Active Directory, disk space, network access and security scans
- ▶ we synchronize our user accounts with the EECS department (IDSG)
- ▶ we obtain enrollments from the Registrar (Student Information Services)
- ▶ we obtain cardkey numbers from the CAL1 office
- ▶ we submit cardkey authorization to our labs in batch uploads to UCPD
- ▶ we bill students' voluntary printer charges to CARS
- ▶ we manage the computers in engineering labs with ESG
- ▶ we manage the licenses for Synopsys/TCAD/HSPICE with the Device Group
- ▶ we manage the licenses for Cadence with the BSAC group
- ▶ we manage the licenses for Maya and Renderman with the BCAM group



Notable Events

See <http://inst.eecs.berkeley.edu/notices.html> for current events.

For additional reports, please see <https://inst.eecs.berkeley.edu/reports>

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