Program Review Division Summary

Division of Science, Technology, Engineering, Math, and Public Safety (STEMPS)

2/20/2014

Introduction to Division

The Division of Science, Technology, Engineering, Math, and Public Safety houses 23 academic disciplines, 3 community service not-for-credit career technical education (CTE) programs, the applied technology tool room, the science laboratory stock/preparation rooms, the Open Math Lab, and the campus Computer Center. The Division is currently staffed by 1dean, 1 administrative assistant, 32 full time faculty, 150 part time faculty, 11 full time classified professionals, 4 part time classified professionals, 30 professional experts, and 5 student assistants each semester.

The Division advances the mission of the college and the missions of its programs through effective and efficient services for faculty, staff, and students. The Division provides opportunities for communication to ensure collegiality, respect, and collaboration to support student completion of transfer, degree, basic skills, career-technical, and retraining goals. To support these goals, the Division of Science, Technology, Engineering, Math, and Public Safety has drafted the following administrative unit outcomes (AUOs):

- Provide effective communication between the Division office and its programs as it relates to student needs, curriculum, policies, procedures and budgets.
- Produce a comprehensive schedule that meets the diverse and dynamic needs of our students.
- Inspire a culture of ongoing learning for faculty and staff through meaningful opportunities for professional development.

Each program within the Division completed an annual Program Review in Fall 2013 which looked back at AY 2011-2012, for the purpose of planning for AY 2014-2015. The following section of this document attempts to capture a division-level summary of the program reviews. The section is organized under the "Program Analysis" categories found in the original program reviews.

Curriculum

Summary: CTE course outlines should be updated every 3 years; there are a significant number of CTE course outlines (>100) in need of updates. Fifteen non-CTE course outlines need to be updated and submitted to C-ID. Three AS-T degrees need to be written and submitted. The amount of curriculum needed is greater than the current capacity of faculty, especially in the CTE areas, and in programs without full time faculty.

Astronomy/Physics: 6 course outlines to update. AS-T in Physics needs to be developed.

Automotive: “None” stated in Program Review. However, approximately 20 course outlines are in need of updates.

Biology: 2 course outlines to update and submit to C-ID. 1 possible new course proposal (cadaver prosection).

Chemistry: 7 course outlines to update. 1 course outline to modify with new pre-req. 1 new course (Chemistry for Non Science Majors). AS-T in Chemistry is awaiting IGETC for STEM guidance.

Computer Studies: 12 course outlines to revise (5 for C-ID). 4 new courses.

Engineering: 2 course outlines to update.

Environmental Studies: 1 new course (lab).

Geology: None.

Math: 1 course outline to revise and submit to C-ID.

Occupational Safety / Radiation Safety: 6 course outlines to update. No FT faculty to complete updates. No PT faculty currently trained to complete updates.

Public Safety: 37 AJ course outlines to update, including 5 for C-ID. AS AJ needs revision; AS-T in Administration of Justice. Up to 26 FST course outlines to update.

Welding: 20 course outlines to update . 1 new course outline (laser welding). Explore DE options. AS in WLDT needs revision. Certificate needs revision.

New Initiatives

Summary: New initiatives span from curriculum and ADT development to new programs aimed at supporting women, students of color, and under-prepared students in the areas of math, science and engineering.

Astronomy/Physics: AS-T in Physics.

Automotive: None.

Biology: Increase biotechnology in classes.

Chemistry: None.

Computer Studies: AS-T Computer Science (requires several new CS courses). CNT program is working on joint program/resources with Chabot.

Engineering: Develop DE ENGR 35 or ENGR 44. Pursue MESA.

Environmental Studies: None.

Geology: Offer GEOL 5 or 7 (Environmental Geology courses). Explore cross-listing these with EVST.

Math: Create an algebra review course. Create and negotiate a new Observation of Instruction Form for Math X. Provide staff development training for Math X faculty. Improve tutorial support.

Occupational Safety / Radiation Safety: Update curriculum, explore certificate and transfer pathways in occupational safety/industrial technology.

Public Safety: EMS/Paramedics will be enrolling 3rd cohort of students as a community services offering; would like to transition program to credit-based. FST Structure Academy.

Welding: Become accredited testing facility, starting SkillsUSA chapter, create partnerships with local industry and high schools, pursue laser welding.

SLOs

Summary: Course- level SLOs are written and regularly assessed. Most programs have written program-level SLOs, but discussion around program-level student learning outcomes is scarce. There is a need to increase part-time faculty involvement, particularly in SLO discussions about student learning, and in programs without full time faculty.

Astronomy/Physics: All courses have SLOs; only 1/11 courses has undergone assessment in the last 2 years.

Automotive: All 14 courses have SLOs. SLOs are regularly assessed.

Biology: All courses have SLOs. SLOs are regularly assessed.

Chemistry: All courses have SLOs. SLOs are regularly assessed. Degrees/certificates have SLOs. SLOs indicate a need for smaller class sizes in Chem 12A/12B, and additional laboratory/equipment budget.

Computer Studies: SLOs are regularly assessed. SLO compensation for PT faculty remains a priority. Discipline specific meetings with FT and PT faculty would be of value.

Engineering: 5/6 courses have SLOs. SLOs are regularly assessed. Program-level SLOs under development.

Environmental Studies: All courses have SLOs. SLOs are regularly assessed. Program-level SLOs exist.

Geology: All courses have SLOs. SLOs are regularly assessed.

Math: All courses have SLOs. SLOs are regularly assessed. Program-level SLOs exist.

Occupational Safety / Radiation Safety: No SLOs. No FT faculty to do SLOs. No PT faculty currently trained to do SLOs.

Public Safety: AJ courses have SLOs. AJ SLOs are regularly assessed. EMS courses have SLOs. EMS SLOs are not regularly assessed. FST courses do not have SLOs. SLO compensation to PT faculty may assist FST with SLO progress.

Welding: All courses have SLOs. SLOs are regularly assessed. Program-level SLOs exist.

Student Data

Summary: Faculty has identified a number of science courses with relatively "lower" success rates; discussion around causes and solutions should occur. STEM and Public Safety programs would like to increase participation of women and students of color.

Astronomy/Physics: Success rates in ASTR are low (<50%); students may be underprepared for college-level science course; may consider adding a pre-req in math. DE students experience lower success rates.

Automotive: None included.

Biology: Success rates are lower in BIOL 20 and ECOL 1 compared to other Bio courses. Enrollments of first year students have dropped by 13% presumably due to section cuts and low priority registration status.

Chemistry: Success rates are lower in Chem 30A compared to other Chem courses.

Computer Studies: Students are more likely to be >25 yo, pursuing a certificate or career skills. Mandatory matriculation, including assessment and orientation, are unneeded barriers for these students.

Engineering: Headcount, success, and completion continue to increase. Enrollment of Latinos has increased. Enrollment of women remains very low.

Environmental Studies: success rates above LPC average.

Geology: Enrollment of Latinos has increased.

Math: Would like institutional research to identify number of STEM vs. non-STEM students, to inform math course offerings.

Occupational Safety / Radiation Safety: Mostly males > 30 yo, pursuing career training or transfer.

Public Safety: Enrollment of women and students of color remains low.

Welding: 94% of students are male. Success rates remain high. Completion rates are low (Certificate and degree need to be updated).

Enrollment Management

Summary: Most programs would like additional FTEF.

Astronomy/Physics: Would like additional 0.2 FTEF to split PHYS 8A from its current 1 double capacity lecture with 2 labs to 2 lectures with 2 labs.

Automotive: Would like additional FTEF; didn't identify for which courses.

Biology: Would like additional FTEF for Zoology and Botany for biology majors.

Chemistry: Would like additional FTEF for Chem 1A. Reduce class capacity for Chem 12A/12B to achieve $\geq$ 50 ft^2/ student.

Computer Studies: Would like additional FTEF for Intro CS courses, Intro CIS courses, and specialty courses such as "App" development.

Engineering: Would like additional FTEF for additional section of ENGR 44.

Environmental Studies: Would like additional FTEF to add EVST 5 to Spring schedule, and new EVST lab. Request separate Enrollment Management Plan for EVST (this already occurs).

Geology: Would like additional FTEF for GEOL 9, 5, 7, oceanography, summer, fall, and evening offerings.

Math: Would like additional FTEF for Math 107, algebra, statistics, 34, 38.

Occupational Safety / Radiation Safety: OSH includes 4 courses offered over 4 semesters. RADS includes 3 courses offered over 2 semester every other year. FTEF varies from year to year b/c RADS is offered every other year.

Public Safety: FTEF for Alameda County Sheriff's Office needs to be institutionalized. AJ would like additional FTEF to grow program.

Welding: No new needs identified.

Human Resources

Summary: Additional classified support is needed across the disciplines (specifically in the labs and CTE programs) and in the Division office. Most programs have requested faculty coordinator release time. Professional development needs exceed the $300/faculty amount typically available to full-time faculty through the Staff Development Committee process.

Astronomy/Physics: Need additional laboratory technician support. Need staff development for faculty and staff on observational astronomy, and SLOs for part time faculty. Request faculty coordinator release time.

Automotive: Need additional laboratory technician support. Need staff development each year to maintain industry standards. Request faculty coordinator release time. Need VP of Administrative Services to support agreements/contracts with outside companies that could provide grants, equipment, and financial support to program.

Biology: Request FT Faculty position – Biology/Botany. Need staff development for all faculty and staff. 70% of courses taught by PT faculty; need departmental workshops to support part-time faculty teaching. Request faculty coordinator release time be increased.

Chemistry: Need additional laboratory technician support. Need staff development each year for faculty to attend American Chemical Society meetings, and safety training.

Computer Studies: Need staff development so faculty can stay current is field.

Engineering: Need staff development on Properties of Materials lab. Request faculty coordinator release time. Request MESA program coordinator.

Environmental Studies: Need additional laboratory technician support. Need staff development funding sufficient to support faculty to attend development opportunities in their primary discipline AND EVST.

Geology: May or may not (unclear) need additional laboratory technician support.

Math: Need additional instructional assistant support for Math X. Need staff development funding for conference attendance. Request faculty coordinator release time for Math X. PT compensation for department meetings and workshop. Would like additional ILC staffing, and student assistants in ILC.

Occupational Safety / Radiation Safety: Need PT training on curriculum, SLOs.

Public Safety: Need classified professional support to meet agency accreditation requirements for EMS and FST, and processing of AJ-ACAD instructional service agreement. Staff development for PT faculty in the subject of SLOs. Staff development for professional development of EMS faculty/staff.

Welding: Need additional laboratory technician support. Need staff development each year to maintain industry standards.

Technological Resources

Summary: A number of computer and software needs were identified, including software updates and faster computers across campus.

Astronomy/Physics: No new needs identified.

Automotive: Software updates for Alldata & scanners needed yearly.

Biology: No new needs identified.

Chemistry: Gas Chromatography - Mass Spectrometry (GC-MS) equipment.

Computer Studies: Need faster computers in 2400 labs. Online lab equipment is important for CNT. Increase Mac (OS/X platform). Yearly software updates needed.

Engineering: No new needs identified.

Environmental Studies: $2000 initial start-up cost for lab materials.

Geology: No new needs identified.

Math: Need faster computers and internet connections so students can access online resources.

Occupational Safety / Radiation Safety: No new needs identified.

Public Safety: AJ could use 50 laptops for report writing class. AJ needs to convert 150 videos to DVD. FST thermal imaging camera.

Welding: Would like virtual reality welding training equipment.

Facilities, Equipment, and Supplies Resources

Summary: Facilities do not meet current needs of most programs. There is a need for appropriately sized science labs, additional computer labs, and additional classrooms, as well as deferred maintenance on "older" buildings. Equipment to support labs is needed. Supply budgets are insufficient. Funding is needed for purchase of supplies to support students' Honors projects; individual departments cannot be expected to finance these projects.

Astronomy/Physics: Need additional storage space for instructional equipment in/near 1800. Would like improved space for observational astronomy.

Automotive: Need more space (classrooms, labs, and storage); recommend that college work with outside industry such as Sandia to acquire space. Recommend that college work with outside industry to acquire equipment/resources to support AUTO program. Need budget for ongoing supplies to support instruction.

Biology: Need larger classrooms; lecture classrooms in 1850 (new science building) are too small to accommodate double capacity lectures (48+ students). Need budget for ongoing supplies to support instruction. Cadaver will be requested. Need funding to support cost of Honors projects.

Chemistry: Need deferred maintenance of 1800, including paint, flooring. Gas Chromatography - Mass Spectrometry (GC-MS) equipment. Need budget for ongoing supplies to support instruction – chemicals, glassware, equipment. Need funding to support cost of Honors projects.

Computer Studies: Need additional computer lab space. Need classroom with workbenches.

Engineering: upgrade, repair, or replace Terco Tension Testing Machine, Terco Torsion Machine, Rockwell Hardness Machine, Terco Fatigue Machine, Mounting/Polishing Machine.

Environmental Studies: Will need access to lab space for a new lab course.

Geology: No new needs identified.

Math: Would like a Math Center (building), calculators for Math X, math magazine subscriptions for library.

Occupational Safety / Radiation Safety: No new needs identified.

Public Safety: Would like a Public Safety Training Facility (building & yard), protective canopies for FST equipment, self-contained breathing apparatus units for FST instruction.

Welding: Need more space (classroom & lab).

Financial Resources

Summary: Program operating supply budgets are insufficient. Professional expert (or instructional assistant) budgets for EMS and FST programs are insufficient; skills labs for certification courses require low instructor/student ratios. A budget for PT faculty compensation for SLO and Curriculum work would be useful.

Astronomy/Physics: Funding to move observational astronomy/observatory.

Automotive: Program operating supply budget is insufficient.

Biology: Funding to sustain cadaver material.

Chemistry: Program operating supply budget is insufficient to support robust curriculum.

Computer Studies: Need increased budget for equipment purchases, staff development for CNT faculty, PT faculty compensation for ADT work, PT compensation to attend department meetings. Budget, including CTE grants is insufficient.

Engineering: Improve lab if program continues to grow.

Geology: Program operating supply budget is insufficient.

Math: Funding to purchase graphing calculators, textbooks to put on reserve in library for student use, additional ILC staffing, student assistants in ILC.

Occupational Safety / Radiation Safety: No new needs identified.

Public Safety: Increase budget for professional experts, which are required for instructor/student ratios of FST and EMS classes (or explore hiring of instructional assistants for this purpose).

Welding: Funding to start up advanced manufacturing courses. Program operating supply budget is insufficient; on-going replacement and repair of equipment should be part of operating budget, not external IER process.

Conclusions

There were a number of themes that emerged from the program reviews. There is a tremendous amount of curriculum to accomplish in the upcoming year. Course outlines should be updated as part of the "regular" curriculum cycle. Plus, additional course modifications/proposals are needed for C-ID and the Associate Degrees for Transfer. The amount of curriculum needed is greater than the current capacity of faculty, especially in the CTE areas, and in programs without full time faculty.

Student data indicates that Las Positas College is experiencing greater enrollments of students of color. Several of the STEM programs are interested in bolstering recruitment and support services for these students.

The issue of reassigned time for faculty coordinators emerged across the program reviews. Most programs expressed that reassigned time was either not available or not sufficient to support the amount of work that faculty take on outside of the classroom. Work such as curriculum, program review, discipline plans, caring for facilities and equipment, and advising students takes a significant amount of time.

Most programs expressed the desire to grow. After several years of cuts, the college is finally poised to add FTEF to the schedule, and most programs want some of the FTEF. Prioritizing how FTEF will be added to the schedule to best meet student needs should be a college goal.

Additional classified support is needed across the Division, including instructional labs, science labs, CTE areas, and the Division office.

Current facilities do not meet the needs of most programs. There is a need for appropriately sized science labs, additional computer labs, and additional classrooms, as well as deferred maintenance for "older" buildings.

Finally, financial resources are insufficient to meet the needs of programs. Currently, programs rely on "one-time" money in the form of Instructional Equipment Requests, technology requests, and/or CTE grants for much of their needed equipment. When "one-time" money and the Measure B bond are exhausted, where will programs go for their on-going needs?

Recommendations

Based on the program reviews from the STEMPS Division, I offer the following recommendations:

The college increase support for curriculum work, as student completion of courses, certificates and degrees is a primary measure of a college's success.

The college seek additional funding to support programs aimed at increasing the number of students of color in STEM.

The Faculty Association and college administration work together to formulate and fund reassigned time for faculty coordinators.

Increase hiring of classified professionals in needed areas.

Draft a facilities plan that captures the instructional needs of programs.