



SCIENCE, TECHNOLOGY, ENGINEERING & MATH DIVISION SUMMARY 2023-2024

SECTION A: ACCOMPLISHMENTS & NOTABLE ITEMS

OVERARCHING THEMES FOR ACCOMPLISHMENTS/NOTABLE

- Textbook Costs/OER: Lots of work being done exploring the use of OER/zero- and low-cost textbooks
- Most of the disciplines are very active in supporting student clubs and working with Lawrence lab.

PROGRAM SPECIFIC NOTES

Biological Sciences -

- Course success rates increased slightly, from 71.3% to 74.3%.
- Ongoing badging program, with multiple badging opportunities in the BIO1A and BIO1C courses.
- Continued the development and inclusion of Biotechnology in curriculum, with improvements made as a result of feedback from student and faculty surveys. Through NSF ATE grant, incorporated hands-on and analytical Biotechnology curriculum into the majors Biology sequence. Student experiences (gauged from surveys conducted through the grant) were overwhelmingly positive. Improvements will continue to be made based on feedback from next round of surveys.
- Developing an assignment for students to set up a LinkedIn profile to help support career readiness.
- Involved in the new STEAM building use planning.

Chemistry -

- Participated (ongoing) in new STEAM building use planning.
- Two new courses created/developed: Environmental chemistry and Energy and Sustainability Lab.
- Faculty participation in SLO assessments increased from the previous year, from 72% to 86%.
- Faculty advised/mentored the following clubs: Chemistry Club; Students for Environmental Action; and the Brazilian Jiu Jitsu Club.
- No discernable equity gaps in student learning.
- There was a notable increase in African American, American Indian/Alaska Native, Filipino/Pacific Islander, and Hispanic students in Chemistry core classes.

- Preparing for the possibility of a sixteen-week semester, which would pose a curriculum challenge because there would be two fewer weeks of lab meetings.

Computer Studies (CIS, CNT, CS) -

- Great outreach efforts continued, such as cybersecurity camp for high school students, Preview night and Open house.
- Continue to foster potential partnership with industries such as LLNL, APPLE and small businesses (through PISCES).
- Establishing relationships and pathways with transfer partners (CSU East Bay, San Jose State).
- Moved to a new building!
- Applied for an NSF grant to focus on providing scholarships for STEM students. New MESA Scholars program.
- Girls Who Code club helps remedy the gender gap.
- Finishing hiring the new MESA Program director.

Engineering -

- Great rates of transfer to both CSU and UC systems.
- Certificate of Achievement for Transfer helps alleviate the challenge with getting the full Associate Degree and Certificates.
- Increase in student success rate in general.
- Many students secured summer internships at the Lawrence Livermore National Lab.
- Collaborated with other programs in STEM to prevent scheduling conflicts for courses and office hours.
- Continuing outreach through Welcome Week, High School Preview Day and Open House, as well as outside LPC, such as CTE fairs at both Granada and Livermore High, the TVROP Annual Advisory Dinner, and at the Tri-Valley Innovation Fair.
- SLOs were renewed and updated, and 3-year plan submitted.
- Department Coordinator became an advisor to Women in STEM Association and hopes to try to start a Society of Women Engineers affiliate.

Geology -

- A much-needed new full-time faculty member was hired for 2023-24.
- Taught a new course for the first time: Earth Science for Educators (GEO 20). Hopes to offer the course regularly each Fall semester.
- No discernable equity gaps in student success; student success rates appeared constant with previous years.
- Exploring and experimenting with the use of low- and zero-cost textbooks options.
- Has plans to purchase a Raspberry Shake Kit, which includes two seismometers – one for use in classrooms and one for permanent installation on campus.
- Seeking a faculty member who could advise a student Geology Club.

Mathematics -

- Faculty trained in teaching Puente cohorts. LPC first college in the state to offer Puente Mas with both STEM and SLAM.
- Was able to offer in-person Math Jam in the Fall 2022 for first-transfer level BSTEM and SLAM students and experienced robust enrollment in our Calculus I sequence.
- OER materials for all of first-transfer level courses, except Math 33 and Math 34, were created/adopted and piloted in the 2022-2023 year for a rollout in all sections starting Fall 2023.
- Math 27 (Number Systems for Educators) was offered for the first time in Spring 2023 thanks to the Strong Workforce Grant and a substantial cohort of early childhood education students.
- Hosted the AMATYC Competition (national mathematics exam that has the potential to award a \$3000 scholarship to the highest scoring participant) both semesters. Had about 50 students participated in Fall 2022, bringing participation closer to pre-covid levels, though struggled with participation in the spring.
- Increased outreach with local high schools. Faculty attended numerous tabling sessions during the Spring semester to share LPC resources such as the geometry class offered over the summer to accelerate the math pathway for high school students. Summer 2023, had six full classes of high school students taking NMAT 256 (noncredit geometry). Students come from both inside and outside of our service area.

Occupational Safety and Health -

- Program continues to experience strong enrollments and has been successful in helping students earn training certificates without incurring additional costs.
- Offering online courses has been effective for making program more accessible to students.

Physics and Astronomy -

- The new Physics Club, an official chapter of the Society for Physics Students (SPS), has attracted students across STEM disciplines and promoted community.
- Field trips to local laboratories and STEM employers have positively impacted student employment, internships and persistence in STEM.
- Astronomy department acquired new eVscope.
- Acquired digital telescope for astronomy lab classes.
- Used for SPS physics club and public outreach.
- Improved observing quality in astronomy labs.
- The department is collaborating with Lick Observatory to use real telescope data in lab classes and encouraging faculty to teach students professional typesetting language LaTeX for lab report writing, which is the industry standard for tech documents in STEM field.

- Enrollment has increased at a higher rate compared to other STEM disciplines.

Viticulture & Winery Technology -

- The Viticulture and Winery Technology facility, which will expand indoor instructional space, broke ground in Fall 2022 and is expected to be completed by Fall 2024.
- The VWT program and Campus Hill Winery showcased Las Positas College at numerous events in 2022-23, including the Tri Valley Chamber of Commerce, Intercollege Wine Competition, and community education partnership.

SECTION B: CHALLENGES AND NEEDS

OVERARCHING THEMES FOR CHALLENGES/NEEDS

- Staffing: Maintaining strong/qualified pool of part-time faculty.
- Still space issues that should be resolved with the new building.

PROGRAM SPECIFIC NOTES

Biological Sciences -

- Staffing: Maintaining a strong and qualified part-time faculty pool is difficult, especially in zoology, cellular and molecular biology, and botany.
- The slow pace of HR processing paperwork for new part-time faculty directly impacts students. This delay results in new faculty without access to rosters, Canvas, and email for several weeks at the start of the semester, requiring other faculty to attend classes and facilitate communication without pay.
- The program observed a lower student success and/or retention for some “DI populations” (compared to average department rates), especially among the African American and Latinx student populations, the latter of which represents the fastest-growing population in the program.

Chemistry -

- Staffing: Maintaining a qualified part-time faculty pool is a constant challenge – the program lost three part-time instructors during the 2022-23 academic year.
- Desperate need for more lab space.
- The possibility of a sixteen-week semester would pose a challenge because it would result in fewer lab meetings. The program is working on preparing for this possibility.

Computer Studies (CIS, CNT, CS) -

- Most of the equipment is still very old, including aged software, locked down environments.

Engineering -

- The 1.0 CAH reassign time for both the Engineering and Engineering Technology is far from enough to accommodate the constant need in new curriculum updates, numerous meetings with advisory board and local industries, work with transfer partners, developing summer camps for outreach.
- Enrollment is down and no time for outreach (see above).
- It's difficult to find qualified part time faculty, important courses have lower success rate probably due to being taught by adjunct faculty.
- There needs to be more support for difficult classes, it's difficult to even find student tutors for this area.
- Need to prioritize courses from Engineering Technology Program (to offer at least once a year) to allow students to complete the degree.
- Might need to find new funds for Solidworks licensing (currently funded by CTE funds).
- Need more technology support during evening classes.
- Getting AS and Certificate in Engineering Technology is a challenge because it's a high unit degree and students don't see the benefit of applying. Could work better if students would be awarded automatically through DegreeWorks.

Geology -

- Adjusting to student demand for alternative modalities. Geology wants to add more Hyflex courses, but didn't have any faculty trained to teach in this modality.
- Historically (over the last few years) having low enrollment has been an issue (although there was a slight uptick in Spring 2023 enrollments).

Mathematics -

- In the Spring 2023 only the Math Jam Calculus sequence had high enough student enrollments to be offered, the SLAM and BSTEM classes were canceled. Since Math Jam is an alternative way of satisfying a required support condition for taking their math class, it potentially drops students from their math class if the corequisite requirement is canceled.
- Funding for Math Jam continues to be challenging and unstable. Funding for tutors and especially food is essential for running this program, as the cafeteria and mini-market is closed leaving no access to food (outside of vending machines) during this week.

- Graphing Calculator free loaner program through the library has been too successful. Inventory is too low to keep up with student demand for this technology. The library has also had a hard time getting students to return the calculators after their sequence of Math classes has ended.
- HyFlex technology in the classrooms leaves something to be desired. The program would like to have a diverse set of classes using various course modalities, but while the idea of HyFlex is great, the faculty who are trained in that mode and have used it immediately request that they not be offered HyFlex classes, for the most part due to the technology in the classroom. However, the training also needs to be more robust with hands on technology training and perhaps role-play of students in the classroom both in-person and online.
- The department's high school tutoring program, which began in Fall 2016, had its lowest enrollment last year, with zero students in the fall and only one student in the spring. The reason for this low level of interest is the onerous registration process and fees that have been reinstated to participate. The program believes that waiving these fees, such as the Student Health Fee, would help increase enrollment in this service to the community.
- Lack of interested personnel to help with needed updates and supports for under-prepared students in our first level transfer courses. Faculty are spread too thin and it constantly feels like an uphill battle to stay on top of all of the updates and changes that are required of the program let alone take the time to really polish and improve what they have.
- APEX (Applied Programming Experiences), a grant with SJSU, works to incorporate computing in introductory Math and Bio courses. The Faculty Learning Community (FLC) is struggling to get new cohorts each year of faculty willing to participate in incorporating modules in their classes.
- Concurrent Enrollment for High School students in Math 2 and higher is based on passed AP scores, which are not reported until mid-July, which means that students need to fill out a prerequisite challenge to take the course. However, Math cannot accept an in-progress grade to satisfy a prerequisite challenge and their class grade is not reported until Mid-June, which is still too late to enroll in an LPC summer math class since they are all full at that point and there is no time to add and staff an additional class. The department is in the process of working on a way to allow HS students to earn credit by exam (CBE) in early May so that it can better understand its enrollment needs and offer the appropriate amount of classes. However, if the numbers match what they were in previous summers, this will be a lot of CBEs to grade. There is currently no compensation for faculty to grade those exams, which means there isn't a lot of buy-in from faculty to want to move forward with this endeavor, which means it will miss out on concurrent enrollment opportunities.
- Equity challenges: The program identified a persistence gap between male and female students. The persistence among female students is lower than male students, especially once they get to Math 1 and BSTEM transfer classes. Success and persistence rates among Latina/o/x students are lower compared to other racial/ethnic student groups.

Occupational Safety and Health -

- Need to discuss expanding the RADS program to offer students the opportunity to become Certified Radiation Control Technicians.

Physics and Astronomy -

- The ongoing issue of finding enough part-time faculty to staff our classes continues. Department has somewhat mitigated this issue by fulling staffing this current semester.

Viticulture & Winery Technology -

- The Viticulture and Winery Technology facility, set to be completed in Fall 2024, will significantly expand indoor instructional space. However, it will require increased staffing including the need for a Winery Manager position, and an increase in the VWT Lab Tech assignment from 50% to 100%.
- Moving into the new facility in Summer 2024 will be challenging due to the large amount of equipment to be moved and set up before the Fall 2024 harvest and student courses.
- The VWT program offers 18 unique courses, a licensed and bonded Campus Hill Winery, a 5-acre vineyard, and cutting-edge CTE equipment, requiring much more than one full-time faculty member and part-time Lab Tech (20 hours).
- During the COVID shutdown, VWT offered in-person classes, including wine sensory labs, but enrollments were low due to fear of COVID among students 40+ in age. Post-COVID enrollments slowly improved, but the college was committed to offering low-enrolled courses for students' educational progress.
- More effective social media marketing and outreach is needed to attract students across age groups (lower enrollment for students under 40).
 - More than 60% of VWT students hold a BA/BS.
 - Approximately 20% of entering VWT students are "freshman" with less than 30 college units completed.

SECTION C: ANYTHING ELSE?

OTHER OBSERVATIONS

Physics and Astronomy -

- SLO Performance Analysis in 22-23 Academic Year
- No statistical differences in SLO performance based on gender.
- Age categories in eLumen group students into 21 or younger and 22 or older. Older students scored lower, possibly due to hiatus or difficulty with college courses.
- Largest discrepancies were between different racial demographics.
- The "Asian" category represents what is close to the "average" population.
- White students and Hispanic students scored higher and Hispanic students scored lower, possibly due to disparity in STEM preparedness due to socioeconomic background.

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- Disparity this year is due to changing local Asian demographic and a larger portion of economically-advantaged white students attending community college.
- A larger number of students from local Cal-State colleges are taking physics classes, especially during summer courses.

SECTION D: DIVISION PRIORITIES

I. LIST OF UNIVERSAL NEEDS/PRIORITIES - IDENTIFIED BY ALL OR MOST PROGRAMS IN THE DIVISION

A. Quick fix (Can be done now or soon; may take little/no extra resources)

1. We can work to hire new part time instructors ahead of time.

B. Interim (more work required but can be done within the academic year)

1. Maintain a deep pool of qualified part-time instructors in all STEM disciplines.
2. Improve the HyFlex technology.

C. Structural process (longer-term work to be done to "resolve")

1. More lab space is needed in most lab disciplines (should be resolved with the new STEAM building).

II. LIST OF PROGRAM NEEDS - IDENTIFIED BY ONLY ONE OR A FEW PROGRAMS, BUT STILL NEEDS CONSIDERATION

A. Quick fix (Can be done now or soon; may take little/no extra resources)

1. Math: eliminate student fees for high school students coming in for tutoring.

B. Interim (more work required but can be done within the academic year)

C. Structural process (longer-term work to be done; research and investigation required to "resolve")