

Program Review Update Division Summary Fall 2018

Division/Area: **STEM (Science, Technology, Engineering, and Mathematics)**

Dean/Administrator: **Nan Ho, Dean**

Other Readers: **Martin Nash, Nadiyah Taylor**

Programs Included:

- Astronomy**
- Biology**
- Chemistry**
- Computer Information Systems**
- Computer Networking Technology**
- Computer Science**
- Engineering/Engineering Technology**
- Environmental Science**
- Environmental Studies**
- Geography**
- Geology**
- Horticulture**
- Occupational Safety and Health**
- Physics**
- Radiation Safety**
- Viticulture/Winery Technology**

**I. Executive Summary (Optional): Please describe the most important themes, trends, and developments in your division or area. Your summary should identify accomplishments, plans and obstacles to success. Your summary should be no longer than 500 words in length.**

The newly-reorganized STEM Division offers robust programs with **outstanding faculty and staff** and **significant growth** in several disciplines in response to strong student demand. Members of the Division are active in shared governance on college and district committees. Many are key contributors to important initiatives, including **AB 705**, which has dominated curriculum work in math, and **Guided Pathways**, which has permeated how programs think about how to serve students in their educational and career goals. Both require **extensive collaborative problem-solving** throughout campus, and offer opportunities for STEM to develop solutions and share best practices. Examples of **successful teamwork** benefiting students are the STEM Scheduling Matrix that includes Bio/Chem/CS/Engr/Math/Physics and the Engineering Technology Learning Community that includes Engr/Math/Welding/WRKX/Counseling/Veterans/A&R. Departments effectively use **enrollment management** to predict and respond to high enrollments.

Faculty and staff continue to innovate and deliver **exemplary learning opportunities** for students in the classroom and the lab and through activities such as Honors Projects, Independent Study contracts, Math Jam, Honor Societies (i.e., AGS, Math, Biology), poster sessions, and learning communities. Faculty work on **new and revised curriculum** included bringing into compliance nearly all course outlines in the Division, updating or creating new transfer & CTE certificates/degrees, and developing new **noncredit** courses in Math, CIS, and Horticulture). Outside the classroom, STEM departments offer and promote clubs, seminars, conferences, summer camps, and events (e.g., Cyberpatriots, Science Bowl, high school tours). Multiple programs have active **partnerships** with the community, industry (e.g., advisory boards), and educational institutions.

The ongoing **impact of recent and planned faculty and staff retirements and resignations** engaged many in the Division in the hiring process. As a result, several **excellent new hires** were made among part-time faculty, full-time faculty, lab technicians, and instructional assistants. Increased use of **student assistants** has occurred in

several programs, increasing support of departmental work and giving students work experience. Issues arising from regional full-employment are having an impact on **retention** of classified professionals. A dozen faculty (one-third of the full-time faculty) continued their progress through the **tenure review process**. This exciting influx of new faculty and staff gives more experienced faculty and staff the opportunity to mentor and share institutional knowledge and culture. Three full-time faculty replacements have been funded; there is still the need for another replacement position in math, and new ones in chemistry (2), math (2), computer science (1), and biology (1).

Rapid growth brings many challenges—**lack of facilities, funding, and time**, and the **need for more full-time and part-time faculty and staff**. A severe **shortage of classrooms and especially laboratories** has resulted in several missed opportunities to add or offer classes to meet demand for STEM courses. Many programs are **at or above capacity** for their facilities. In Fall 2018, over 1100 students were on waitlists for STEM courses, with 900+ students on waitlists for Math, Biology, Chemistry, and Computer Science. Even with added sections in Spring 2019, these same four programs had 650 waitlisted students. The **lack of full-time faculty** has made it increasingly difficult to staff classes even when we can offer additional sections. **Scheduling** classes across interlinked STEM departments to facilitate students' timely completion of degree or transfer requirements is complex due to multiple constraints (space, staff, conflicting classes, block schedules, prerequisites, load, AB 705, enrollment patterns, etc.); the faculty and staff work together to optimize schedules.

The **Facilities Master Planning** process has allowed programs to envision exciting ways to offer instruction and services over the next 5-20 years. Measure A funding has already been approved for **Building 2200**; among those moving into the new facility are Math, Computer Studies, and Building 2100 faculty and staff. Also approved are separate facilities for **Viticulture** and **Horticulture**, which have outgrown their outdated and insufficient spaces. **New and renovated science buildings** are a high priority for the next phase of the Facilities Master Plan. At the same time, programs already at capacity must address how they will **accommodate increased demand for STEM classes in existing facilities** over the next 5-7 years.

STEM programs have had **success with Instructional Equipment Requests** and other grants (CARE, LPC Foundation). **Funding of supply budgets**, however, have not increased proportionally to growth in programs, and were complicated this year due to decreased funding. **Maintenance budgets** were also cut back significantly this year. The College has worked diligently to find alternate funding streams.

Faculty continue to struggle with the **lack of adequate time** to complete their many responsibilities. There is an ongoing concern about requests being made through the Program Review process not having results. STEM at Las Positas has a pivotal role in the regional response to labor market shortages; faculty and staff will need **professional development and time** to explore how to integrate these emerging fields and careers into their programs. There is a desire for **FLEX** Day and variable flex to allow more departmental work. **Recruitment for advisory boards** can be a challenge, as the CTE programs in STEM have either only part-time faculty or only 1 full-time faculty. Increased **classified professional support** (STEM Coordinator, lab technicians, instructional assistants), more **full-time faculty hires**, and **increased faculty reassigned time** will allow already excellent STEM programs to sustain their existing programs and develop the curriculum, outreach, and partnerships demanded by a STEM workforce.

## **II. Recommendations: Please list your most important recommendations for planning in your division or area. Note any recommendations that are connected to our College's Planning Priorities or Educational Master Plan.**

- Support departments in identifying and requesting sufficient resources for staffing, equipment, supplies, and technology. (Educational Master Plan-Educational Excellence, Supportive Organizational Resources)
- Support increased FTEF allocation through enrollment management to address dramatic growth in STEM program (Educational Master Plan-Educational Excellence, Supportive Organizational Resources, and Organizational Effectiveness)

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- Support institutionalization and funding of various specialized student learning spaces and programs (Math Learning Center, Computer Center, Biology Learning Center, Math Jam, Maker Space, and Engineering Technology Learning Community). (Planning Priorities-Tutoring Services and Student Success; Educational Master Plan-Educational Excellence)
- Support increased staffing (Planning Priorities-Tutoring Services and Student Success; Educational Master Plan-Educational Excellence, Supportive Organizational Resources)
  - Hire replacement and new full-time faculty
  - Hire STEM Coordinator
  - Increase lab technician coverage in science and horticulture/viticulture
  - Increase math instructional assistant hours
- Support increase reassigned time to more accurately reflect responsibilities (Educational Master Plan-Educational Excellence, Supportive Organizational Resources)
- Support stabilization of supply and equipment maintenance budgets (Educational Master Plan-Educational Excellence, Supportive Organizational Resources, Organizational Effectiveness)
- Secure ongoing funding for vineyard care (Educational Master Plan-Educational Excellence, Supportive Organizational Resources; Educational Master Plan-Community Collaboration)
- Support curriculum processes (departmental review, curriculum committee) to encourage regular review of curricular needs in course outlines, certificates, and degrees. (Planning Priority-Curriculum; Educational Master Plan-Educational Excellence)
- Support faculty and staff in addressing how to sustain rapid growth in STEM over the next 5-7 years using existing facilities which are at or above capacity(Planning Priorities-Tutoring Services and Student Success; Educational Master Plan-Educational Excellence, Supportive Organizational Resources; Organizational Effectiveness)
- Support work on Measure A/Facilities Master Plan to reflect the specific needs of programs; encourage user groups to form and begin more detailed analysis of needs (Planning Priorities-Tutoring Services and Student Success; Educational Master Plan-Educational Excellence, Supportive Organizational Resources)
- Support increased engagement of part-time faculty in program responsibilities (curriculum, outreach, etc.)
- Support cross-disciplinary work on optimizing scheduling, given Guided Pathways, AB705, and limited facilities (Educational Master Plan-Educational Excellence)
- Support program outreach to and partnerships with community, educational institutions, and industry (Educational Master Plan-Community Collaboration; Educational Master Plan-Supportive Organizational Resources, Organizational Effectiveness)
- Support professional development of faculty and staff (Educational Master Plan-Educational Excellence)
- Support development of part-time faculty pools. (Educational Master Plan-Supportive Organizational Resources, Organizational Effectiveness)
- Support streamlining and standardizing of institutional processes to alleviate time demands on faculty and staff. (Educational Master Plan-Supportive Organizational Resources, Organizational Effectiveness)

### III. Program Review Themes by Category

Please describe the most important themes, accomplishments and challenges for your division/area in each of the following categories. If a category does not apply to your division/area, or if that category was not discussed in your division/area's Program Review Updates, please write "Not Applicable."

#### a. Community Relationships and Partnerships

Such as outreach, recruitment, internships, industry collaborations.

Almost all programs have partnerships with community programs and industry. Some connect to the K-12 system. Other are creating new degrees/certificates for specific populations by partnering with industry and others. Faculty and staff need time and support to develop community relationships and partnerships. Opportunities for

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outreach and partnerships occur on a regular basis; some of these opportunities are not pursued due to lack of faculty with capacity to lead the effort.

- Biology has a pilot partnership with a local biotech company
- Biology works with the BioSciences advisory board
- Biology reports development of Environmental Studies and Environmental Science Programs requires collaboration with Physics (currently ongoing) and creation of an Environmental Studies/Sciences advisory board with faculty, employers, and community representatives
- Computer Studies is collaborating with Google in designing a course sequence leading to Google IT Support Professional Certificate
- Computer Studies reports funding partner Jobs for the Future will continue to explore ways to fund Google IT Support program
- Computer Studies has updated their website and has posters as well
- Computer Studies has reinstated their Advisory Board, works with consortiums such as Bay Area ICT, local high schools and ROPs; they are engaging in a significant amount of outreach to local institutions
- Computer Studies submitted a grant proposal to NSF IUSE for funding for a "Code Jam"
- Engineering has an advisory board
- Geology and Engineering student build team partnered with Robot Garden in the construction of the AR sandbox, using it as a build space
- Geography is partnering with Weatherbug in the maintenance and upkeep of the weather station above 1850
- Horticulture is collaborating with Pleasanton USD, Sunflower Garden Foundation, and Tri-Valley ROP, among others, for Adaptive Horticulture
- Math reports a successful partnership with Livermore school district (LVJSD) in launching an on-campus tutoring program offered as non-credit
- Math meets regularly with high school faculty to discuss alignment of curriculum
- OSH notes they have "struggled to develop partnerships with the industry"
- VWT reports a desire to increase marketing for the Wine Hospitality Certificate

### **b. Curriculum Committee Items**

Changes made through the curriculum committee, such as changes to course outlines, degrees and DE status.

All of the programs are working on curriculum projects at this time, with several creating or exploring new certificates or degrees. The Division has successfully created or updated hundreds of courses in the last two years. Only a handful of course outlines are overdue. Several programs are updating curriculum to meet industry, while others are modifying units or DE status.

- BIO updated BIO 70, AA Biology, AA-T Biology emphasis in Allied Health
- BIO created the AA Computational Biology and a Certificate in Computational Biology as result of examining labor market data
- BIO created a field biology course as part of Environmental Studies certificate
- CHEM modified two degrees
- Computer Studies is making significant progress on evaluation of degrees and certificates across their disciplines and developing the Cyber patriots program
- CS reports updating and deactivating a large number of courses, and is currently updating programs in curriculum committee
- ENGR 46 increased from 3 to 4 units
- Geology made many course outline updates to meet C-ID
- GEO created a Geology Certificate that becomes active in Fall 19, Historical Geology 2, and updated the AS-T catalog description
- GEOG notes all course outlines are currently up to date
- HORT offers four progressive certificates of achievement and a certificate of completion

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- MATH is requesting DE status for most transfer-level courses
- Math co-requisites for some Physics courses have been updated to improve articulation to UCs
- OSH reports all four courses have been approved for DE status. They hope to move toward offering on online degree program.
- PHYS has updated all Physics and Astronomy course outlines
- VWT has updated all course outlines, degrees, and certificates and updated them in the catalog and the website

### **c. Enrollment Management**

Changes to section offerings, such as adding/removing sections or increasing/lowering class size.

Programs are actively engaged in their enrollment management processes and utilize discipline plans to prioritize class offerings. Several programs request more reassigned time due to the number of projects being coordinated within disciplines and many non-instructional commitments. Several programs have been able to add new sections to meet student demand; maintaining those sections will require continuing FTEF support. Many programs have impacted classes and long waitlists, and several were able to modify offerings immediately prior to the semester.

- Several programs identified a need for either adding or increasing reassign time for coordination of programs
- Programs made changes to section offerings, such as adding/removing sections or evaluating class size.
- Geology added lab sections (that had been cut in the past)
- BIO reports increase in enrollments and head count
- CHEM added a fifth section of Chem 1A and reports another could have filled based on the waitlists
- CHEM would like to offer a double section of CHEM 31 due to long waitlist in the previous year's offering
- CS reports overall "dramatic growth" in enrollments and a "noticeable increase" in diversity of students. CS in particular (not CIS or CNT) has doubled in last four years
- ENGR 46 added a unit
- ENGR reports the stipulated standard of 525 WSCH/FTEF is not realistic
- ENGR reports two courses once offered once a year are now offered twice a year (fall and spring) to help students' pathways to transfer requirements
- ENGR students have doubled in number in the last four years
- GEOL offered a late-start environmental course and had good enrollments
- GEOG cut a summer class and replaced it with an online class (not in the summer) to help with demand. Otherwise, number of students and courses have remained consistent
- HORT reports adjusting course sequencing to help students get a certificate in two years; however, this is still not possible for some certificates
- HORT reports a "slow rise" in enrollments
- MATH has added sections of Stats and Calculus I and canceled sections of Intermediate Algebra and Core Intermediate Algebra, likely because of changes in placement
- VWT reports increased enrollments and number of students served

### **d. External Factors**

Such as state/accreditation mandates or advisory board directives.

Several programs have active advisory boards that guide programs toward meeting workforce needs. Recruitment for advisory boards is a challenge, as the CTE programs in STEM have only part-time faculty or only 1 full-time faculty. Regional growth offers both opportunities (more program partnerships, and students) and also challenges (traffic, cost of living affecting recruitment).

- Labor Market Data has encouraged Biology to develop a Computational Biology degree and certificate
- Productivity goals may not be realistic for courses that have a lab component

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- Computer Studies surveyed students to explore their interests for additional coursework and long-term educational plans
- Guided pathways and AB 705 are impacting programs
- Adding an additional unit to ENGR 10 to articulate to SJSU's Intro to Engineering Course
- BIO is updating BIO 40 for CID
- CS reports the CS Advisory Board was reinstated and updated in Spring 17
- ENGR Advisory meetings are continuing
- Engineering reports no formal way to count Engineering transfer students
- GEO 5 and 7 submitted and accepted for state CID equivalence
- OSH Advisory Board is undergoing revitalization
- VWT reports the need to equip facilities and hire instructors as per request of the VWT Advisory Board

### **e. Facilities, Supplies, and Equipment**

#### Purchasing or upgrading

Programs are growing rapidly and have high enrollments. Programs are severely hampered by lack of lab and classrooms that meet specific disciplinary needs and insufficient equipment and supplies for the continued program growth. Lack of space is impacting both student learning opportunities and opportunities for programs to develop, and makes scheduling courses very difficult for all programs in STEM. Several programs share concerns about the need for storage for materials, lockers for students, food-safe spaces in the labs. The Facilities Master Planning process will be instrumental to addressing how to sustain growth in these programs.

- BIO requires additional facilities—lab and lecture space—due to program growth (number of sections and students). Size of BLC is not meeting student need and requirements for faculty oversight. In particular, new or additional space for Anatomy and Independent Study/Honors students would help. Also, more lab space needed for expansion of partnership with biotech company
- Biology needs space for safe food storage
- BIO reports low technician coverage in buildings, particularly in evenings and summer
- Biology's pilot partnership is in jeopardy as well as the potential to develop and grow the Environmental Sciences program
- Bio FT faculty have a hard time making load when teaching BIO 30 because of lack of lab space
- Office hour access within the BLC is challenging
- Bio would like an electronic check-out system for supplies
- CS reports lab space improved with 1000 building but more space is still needed, especially considering specialization of equipment needed
- Computer Studies requires specialized equipment, software and lab rooms and would also like a display area
- There was a successful update to the Geography Weather Station
- Geology plans to update their lighting in their 12 display cases to LED
- Chairs in room 1828 need repair or replacement
- Astronomy needs a home, as well as access to dark sky locations to be able to make use of current equipment
- ENGR reports a room dedicated to Engineering in the 1850 building never materialized as discussed when the building was built
- ENGR reports storage for materials is inadequate
- ENGR reports they have identified facilities challenges in past program reviews but they have not been resolved
- EVST reports need to share new future lab space with Physics and Biology
- GEO is requesting new chairs in 1828

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- HORT identifies lack of consistent lab and classroom space as a significant challenge. They note they lost their space several years ago. Storage area is also a challenge and lack of it is damaging important equipment
- HORT reports the Horticulture Yard, shade house, and irrigation system are in need of updating
- HORT cannot offer a new class because there is not a classroom with CAD capability
- MATH identifies a strong possibility of lack of computer classrooms available when AB705 takes effect.
- MATH reports the desire for a Proctoring Center
- PHYS identifies access to two dedicated labs as a challenge. One of the labs they currently use is shared with ENGR, which makes for difficulties. The author suggests modifying room 1826 for Physics. The room's current user has agreed to move to a different room. A long term solution is two dedicated labs and lecture hall specific to needs of the discipline
- PHYS identifies lack of storage as a challenge
- PHYS requests a home for astronomy such as a dark sky facility, or a dome on campus. The author notes this request has been ongoing
- VWT reports a lack of space for instruction and identifies this as a potential safety issue. Students also report this as a problem
- CHEM reports lack of lab space and lockers as an obstacle. Also, equipment is aging and needs updated. The author notes, "The Chemistry Program has outgrown its current lab infrastructure." Entirely new facilities are requested
- CHEM reports lack of lecture space near the science building is an obstacle

### **f. Financial/Budgetary**

Program budgets or special funding.

Nearly all programs report a need for increased budgets. Most have created robust and growing programs but cannot sustain excellence without appropriate increase in funding. Some have not been updated in years, while others have not been increased to meet the growing demand for supplies and materials based on number of students being served. A few programs want to find funding to meet specific professional development needs or to build and maintain relationships with their part time faculty who should be compensated for their time. Finally, others need funding to continue projects that may end if the current funding source sunsets.

- Biology needs an increase in budget to match program growth
- There is a need to institutionalize funding for efforts such as Honor's projects, independent study, and expanding program offerings
- CS reports receiving a \$30,000 grant for Google as part of implementation of Google IT Support Professional Certificate
- Computer Studies also received Strong Workforce monies to cover 90% instructional costs for the associated courses for the Google partnership
- Geography is limited in updating equipment due to insufficient budget
- Geology reports negative impact of budget constraints
- Grants were applied for and received to benefit physics and engineering
- Program budgets or special funding
- BIO requests increased stable and consistent funding so lab supplies can meet program growth and industry technology needs. Funding for independent study student needs requested as well to meet inequity in current funding system (often from students' own spending)
- BIO requests funding for back-up system to carbon dioxide delivery system
- BIO reports 2 CAH for department coordinator position is insufficient considering size of the program.
- BIO reports funding for conferences and professional development is insufficient
- BIO requests more funding for lab safety training for faculty and staff

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- ENGR reports CAH for department coordination is insufficient and disproportionate to CAH provided to other department coordinators. Administrative duties are especially time-consuming considering it is a one-full-time-person department
- EVST requests CAH for coordination, or for additional CAH to be added to coordinators involved (Physics, Biology, Chemistry)
- GEOG notes updating equipment is an ongoing challenge due to a small budget
- MATH requests reassign time for Emporium and Math Jam coordination. Its support by a grant will run out in a year
- VWT reports the need for an equipment maintenance budget, especially once the new winery is completed in 2020. The current model of having instructor provide maintenance will not be possible as the new equipment will need professional maintenance and repair
- CHEM requests increase to 2 CAH for department coordination rather than the current 1 CAH
- CHEM requests continued funding for supplies and equipment
- CHEM requests increase in budget due to the new lab sections

### **g. Human Resources**

#### Hiring and staffing needs.

While there have been recent faculty and staff hires, there has also been turnover due to retirements and resignations. Almost all programs indicate needing more faculty or staff meet program needs. Lab programs have been impacted by having 10-month positions for their lab assistants/coordinators and/or by the position salary scales. The STEM Coordinator position and Learning Community Support Specialist needs to be converted to a permanent position to support the multitude of programs and initiatives of STEM. Programs would like to support more part-time involvement in department activities and need financial support.

- BIO, CHEM, CS, and MATH request permanent position for STEM Coordinator. Currently funded by temporary grants. CS reports lack of STEM coordinator is an obstacle
- Multiple programs mentioned the need for a full-time STEM coordinator
- Many programs mentioned a concern about enough PT faculty
- Engineering needs a FT student support specialist
- A few programs have been impacted by sabbatical leaves or retirements
- CS reports two full-time instructor resignations and has submitted position requests to fill those positions, as well as an additional position request for full-time instructor. They identify hiring a third full-time position as "critical"
- Increase in biology and chemistry courses offered in different buildings has resulted in low technician coverage; requested the positions to be full time and 12 months; this would help with retention
- Astronomy needs lab technicians and instructors
- Time is needed for full and part time faculty to meet and plan for program sustainability and growth opportunities
- Overall programs identified not having enough personnel to complete ongoing new demands of faculty
- A few programs hired faculty recently
- BIO hired full-time instructor
- BIO requests HR help in establishing a pool of part-time instructors, requests advertising positions on CCC registry. Desires focus on diversifying hires. GEOG also notes this challenge and requests more marketing
- OSH notes a need for more qualified instructors as well
- BIO requests lab tech positions be made full-time, 12-month positions
- BIO is submitting Faculty Position Request for new faculty member in Allied Health
- BIO and EVST report lack of paid substitutes affects students when faculty travel for conferences
- ENGR reports the loss of an important Student Services Specialist because the funding for the position was not picked up by LPC as had been the understanding when the grant money ended. A part-time position is currently being funded but ENGR requests a full-time position



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- EVST requests lab tech position increasing from 10 to 12 months, hiring a part-time tech, or adding to load of current lab techs
- GEO will need to replace the retiring lab tech
- MATH reports the desire to hire a part-time Instructional Assistant to replace a similar position that was eliminated recently. Also, they look forward to filling the full-time position that has been covered on a temporary basis
- MATH reports the need to hire more full-time faculty
- OSH reports only having two part-time faculty as an obstacle and wants to consider hiring a full-time instructor
- VWT reports the need to hire more full-time faculty as the program expands due to the federal bond and six new classes are offered
- CHEM would like to hire two more full-time faculty. Another full-time faculty member will resign in Spring 19, so another hire will be needed as well
- CHEM reports the extension of a lab staff position from 10 to 12 months had positive effects on summer offerings and all labs

### **h. Learning Support**

Services provided to support student learning, such as tutoring and library support.

Programs innovate, support, and offer excellent programs to support students. Examples include clubs/honor societies, tutoring, mentoring, honors projects, independent study, learning community, faculty advising, and specialized learning spaces. Math and Chemistry have created a number of projects, in partnership with others, to provide learning support to students

- Computer Studies identified an increased need for student tutoring and need to recruit tutors
- Computer Studies submitted a grant proposal to fund a Code Jam program for students heading into CS1
- Geology offered a late start class in Geology Environmental course that was successful with students
- BIO reports difficulties in students checking out equipment
- CS reports surveying students and finding most students are interested in transferring to a 4-year institution. They also desire elective classes that cover material not covered in current classes.
- ENGR reports need for full-time Student Specialist position
- GEO hired a student assistant to help with the rock, mineral, and fossil sets

### **i. LPC Collaborations**

Collaborative projects bringing together different programs/areas within LPC.

STEM faculty and staff are outstanding collaborators. Because so many students take classes across several STEM fields, the faculty must work together, using a matrix of classes, to schedule in the best interest of the student.

- The STEM Matrix requires collaborative scheduling for Math, Biology, Chemistry, Physics, Engineering, and Computer Science
- The Allied Health Matrix involves collaborative scheduling between Biology and Chemistry
- GE offerings in STEM requires collaborative scheduling for Astronomy, Biology, EVST, Geography, Geology, and Physics
- BIO reports development of Environmental Studies and Environmental Science Programs requires collaboration with Physics (currently ongoing) and creation of an advisory board with faculty, employers, and community representatives
- CS reports continued involvement in Guided Pathways work
- EVST reports collaborating with CTE to determine need for technicians with environmental skills. This will potentially lead to collaboration with private and public partners.
- PHYS reports lab tech collaboration with CTE in seeking and receiving grant funds
- PHYS reports working with ENGR to develop a class matrix to help guide students

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- VWT has collaborated with M & O to improve aesthetics of the vineyard and relationships with homeowners

### **j. LPC Planning Priorities**

Available here: <https://goo.gl/LU99m1>

- HORT reports their non-credit CTE classes support several parts of the Master Plan priorities A, B, and C

### **k. Pedagogy/Teaching Methods**

The process of teaching students. Not limited to instructional programs/ areas. Might include teaching/counseling/tutoring methodology, class activities or course design.

- Biology is moving toward more inquiry- and project-based instruction to match industry standards
- Biology is seeing more student success in DE based courses
- BIO created six Smart Shops to help students' basic skills needs
- Computer Studies has continued the implementation of robotics technologies into CS courses
- Geography identified a large number of students cheating in online courses and is working on ways to mitigate this concern
- Geology has changed the teaching of some of its lab courses to enhance student learning and success, such as changing approach to labs so they scaffold on earlier labs more
- GEO reports the AR Sandbox, a collaboration between students and different disciplines, is mostly complete
- Physics is developing new experiments and techniques for lab classes
- MATH changed a no-unit lab to meet face-to-face with the instructor
- MATH is developing concurrent support courses to help with challenges from AB 705

### **l. Professional Development**

Activities and resources to enhance employee knowledge and skills.

Some programs and faculty have had many opportunities for professional development. Several programs mentioned not having access to professional development support although professional development funding is particularly more available for STEM and promoted on campus. The flow of information about these resources could be evaluated. Programs identified specific professional development needs for full-time and part-time faculty. There are several recommendations regarding FLEX day and variable Flex.

- Biology, Computer Studies requested additional funding to be able to attend workshops which are expensive
- A few programs mentioned the need for funding and time to complete required coursework for industry-specific certifications for faculty
- CTE funds have helped some faculty be able to attend more expensive conferences
- The forms for reimbursement need to be streamlined and updated
- Lack of paid substitutes is a barrier for faculty to attend conferences
- There is a desire to have flex day workshops be hands-on where work is completed or projects made
- BIO reports focus on including part-time instructors in meetings, development of more opportunities for part-time instructors to meet contract obligations
- BIO reports some faculty attended conferences this year
- CS reports time and funding for professional development are not sufficient
- CS reports lack of conference funding is a challenge for some conferences with high price points; however, faculty members have regularly attended conferences
- EVST faculty were able to attend conferences because of increased funds available as well as CTE funds; however, development opportunities outside the region are limited due to limited funds.
- EVST faculty collaboration meetings (meetings between disciplines in other programs) are not being funded or accepted for FLEX hours. They hope for this to change

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- GEO requests more time and flexibility for department meetings on FLEX Day so that part-time instructors can more easily participate
- GEOG reports part-time faculty have been attending a yearly conference held by a statewide geography organization
- MATH notes more professional development is needed to prepare Math faculty for challenges of AB705 They recommend professional responsibility hours be allowed to include this type of professional development. Incentives for training should be made available
- MATH reports several faculty members having attended conferences and workshops for professional development
- OSH reports part-time faculty need training in DE instruction
- PHYS reports faculty have been attending conferences and holding meetings
- VWT reports additional training will be needed in preparing faculty for the new equipment in the new winery facility
- CHEM requests more funding be made available for conferences
- CHEM faculty have attended STEM Success Workshop and AB 705 workshop

### **m. Services to Students**

Non-instructional services provided to students. Not limited to Student Services programs/areas.

Programs are creative in providing support to students to complete their certificate/degree/transfer goals in a timely fashion, have clearer professional paths, and/or providing students with access to information through department or faculty websites. Pathways are sometimes, but not always clear to students; there are many opportunities to improve this service to students. There are multiple services available to students: clubs, tutoring, honors projects, independent study projects, etc.

- Honor societies and clubs are active in STEM
- Multiple departments have begun employing student assistants

### **n. SLOs/SAO Process**

The process of creating, recording and assessing SLOs/SAOs (not the SLO findings; those could appear under pedagogy, curriculum, enrollment management, equipment, etc., as applicable).

The Division office works iteratively with faculty to help all programs approach 100% SLO compliance for syllabi Programs are in varying stages related to their process of collecting and assessing data. There is a desire for more opportunities to engage part-time faculty in SLO discussion. eLumen's user interface and functionality continue to be a challenge.

- BIO results of assessments of three courses' SLOs. Noted no significant change. More data is needed due to small size. Will continue assessments
- CS reports updating CSLOs
- CS assessed a CSLO and learned student performance has increased over the last three semesters. Repetition in teaching the course is noted as a possible reason why
- ENGR plans to develop more "extensive" CSLOs and PSLOs
- ENGR reports 90% mastery in assessment of a CSLO. They found student success was lower in summer.
- ENGR reports tracking of students who successfully transfer to a 4-year institution to be lacking and sees this as a limitation of the SLO process
- EVST plans to create more SLOs for EVST 5
- GEO reports SLO assessments showed positive results generally. Some instructors noted the need to post reminders about quizzes and exams, as well as opportunities for additional practice.
- GEOG reports a desire to have more time or a process to allow instructors to get together to discuss SLO results
- MATH reports thorough analysis and discussion of SLO data

## Program Review Update Division Summary Fall 2018

- OSH reports they are currently developing SLOs
- PHYS will hold a discussion of new SLO results in spring
- CHEM reports the need to examine ACS standardized exams and comparing to SLOs

### **o. Technology Use**

How technology is used to instruct/serve students or for other college functions.

Several programs are using technology to enhance student learning and to provide information for students via faculty/department websites. Some identified a need for new or upgraded technology

- Canvas has a program called Proctorio that may help to reduce the capacity for students to cheat on exams when in online courses
- BIO requests funding for meeting industry standards in technology
- GEOG notes the GEOG lab software was updated
- GEOG notes that examination of differences in DE student performance led to the discovery of widespread online cheating (in other disciplines as well). As a result, a committee was formed to examine online cheating, and GEOG online content was examined and revised