

Section 1 and 3 - Analysis of Unit PIE & Updates on Goals

PIE - Natural Sciences Division Manager

2018-19

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Division Mission Statement: The mission of the Natural Sciences Division is committed to providing quality STEM education, services, and workforce training so that students become productive members of a diverse, sustainable, global society.

1. Summary of Notable Achievements: The Natural Sciences Division is composed of nine departments/programs and offers degree, certificate and transfer programs in agricultural sciences, astronomy, biological sciences, chemistry, computer science, earth sciences, engineering, mathematics, and physics. In addition, we also house outstanding academic support units such as the STEM center, the MARC/TMARC, and the Mountie MakerSpace. Our commitment to providing a learning environment that enhances student success is supported by the state-of-the-art Science Center, boasting a number of special features, labs and amenities to facilitate innovative instruction and programs as well as the Farm and Wildlife Sanctuary which provide students hands on exposure to nature.

Events such as the Kepler Scholarship Program, and Farm Day were extremely successful and well attended this year. The Kepler Scholarship program raised approximately \$12,000 and was once again a big success. Farm Day brought in a record 3,000 participants! All events were well supported by the Division and will continue to be an ongoing goal of ours.

Students continue to experience a once in a lifetime opportunity to conduct research on planetary surfaces with a Goniometric Photopolarimeter generously provided by retired NASA principal scientist Robert Nelson. Of only five labs in the world, the Natural Sciences Division at Mt. SAC is the only lab of this kind in the United States as reported in the Mt. SAC Annual Report to the Community.

Below are a few highlights (certainly not the entire list) organized first by college theme, then by department.

Notable Achievements for Theme A: To Advance Academic Excellence and Student Achievement

Agricultural Sciences:

- Our students were awarded thousands of dollars worth of scholarships.
- The Turf Team won 2nd, 3rd and 4th place in the National Student Challenge in Phoenix, AZ.
- The Horticulture Club competed in the design competition at the South Coast Plaza Spring Garden Show and won first place in the student category for the second consecutive year.

Biological Sciences:

- The Biology department hired 1 new full-time faculty member, Xavier Lopez.
- Jennifer MacDonald won the President's Award at California Society for Histotechnology.
- EAGLE and Biology club won one of the President's Sustainability Award.

Chemistry:

- The Marie Curie Chemistry Scholarship was awarded for the third time.
- The Department used royalties from Department-authored lab manuals to present awards to outstanding students in all courses.
- A student was selected for the Orange County American Chemical Society (ACS) Outstanding Chemistry Student award (April 2019). Professors Leung and Kung attended the recognition ceremony with the student.

Earth Sciences & Astronomy:

- Student Chelsea Adelman, was selected for the CalBridge program.
- Student Travis Navarrete, was accepted to the NASA SIRI internship program.
- Three students: Robert Zhou, Morgan Palmer and Joel Gutierrez participated in laboratory observation experiments (with Drs Boryta and Nelson) on reflectance properties of various substances of interest in planetary sciences. All three students have been listed as co authors on numerous abstracts and poster presentations in the US and abroad (China, Ukraine).

Math & Computer Science:

- Students participated in the AMATYC Student Mathematics League (a national math competition) Fall 2018 and Spring 2019. This event was organized by Steve Zicree.
- The Math & Engineering Club held successful Integration and Factoring Rallies in November 2018 and May 2019. Over 100 students participated.
- Computer science students participated in our first local Hack Day events in Fall 2018 and Spring 2019. Most participants were our own Mt. SAC students who were joined by local high school students and members of our community. This event was organized by Tuan Vo, who was assisted by Daniel Chen.

Physics & Engineering:

- Robotics team competed an international event and won the Judge's Trophy
- Students won 3rd highest award at the So Cal regional Lower division research conference for work on rocket telemetry and avionics
- Awarded three scholarships from Anderson Memorial Fund

MakerSpace:

- There are more than 1400 MakerSpace members who are a combination of students, faculty, staff and the community, spending over 20,000 hours working in the MakerSpace in 2018/19.
- Hands-on student and community projects (students working in MakerSpace to complete projects), and support is provided for students across disciplines, Divisions and majors.

STEM Center:

- The overall persistence of STEM center students was 40%, up from 29%.
- The students persisting are found in under-represented populations, indicating that the STEM center is assisting more demographically under-represented students achieve persistence in STEM.
- Students using the coaching program in Anatomy and Biology are more successful in all semesters except Summer.

Notable Achievements for Theme B: To Support Student Access and Success

Agricultural Sciences:

- Purchased copies of textbooks for horticulture classes, to be placed on reserve in the library and increase student access to these textbooks.
- Implemented an application process for the RVT program to insure that students entering the upper level courses have completed the required general education classes, which will help insure student success and relieve some of the registration bottleneck in the upper level courses.
- According to the Core Indicator report published by the Chancellor's office, which tracks success in skill attainment, participation, completion, and employment, the horticulture programs are showing success well above the College's negotiated levels in all reported categories. Most notably, non-traditional (female) displaced homemakers were participating in our programs at 30% above the college's negotiated rate. Employment was 21.5% above the negotiated rate.

Biological Sciences:

- Beta Meyer has served as STEM center coordinator.
- Biology faculty contributed to the STEM center by holding office hours or additional supplemental hours in the STEM center.

Chemistry:

- Interviewed, hired, trained and mentored several new adjunct faculty members
- Resubmitted Chem 9 for GE approval at the state level
- In final stages of developing CHEM 55 – Chemistry for Engineers

Earth Sciences & Astronomy:

- The planetarium celebrated its 50th anniversary To date (5/6/2019) 3099 Mt. SAC students visited the planetarium.

-We once again held an extremely successful Kepler scholarship event which featured Dr. Suzanne Smrekar, deputy Principal Investigator of the Insight mission.

-Anders: Mt.SAC was selected through the Monterey Bay Aquarium's Adopt-a-Float program to name a SOCCOM (Southern Ocean Carbon and Climate Observations and Modeling Project) float. "Doc Baldy" started collecting data on temperature, salinity, pressure, oxygen, chlorophyll, nitrate, particles and acidity (pH) in the Southern Atlantic in October 2018. Faculty of all related disciplines can and are encouraged to use real-world/-time data from this float for their classes.

Math & Computer Science:

-In response to increased student demand, additional upper-level STEM classes were offered.

Spring 2018 -> Spring 2019 (increase of 10 sections)

150 - same (7 to 7)

160 - down by 1 (7 to 6)

180 - up by 3 (11 to 14)

181 - same (10 to 10)

280 - same (6 to 6)

285 - same (3 to 0)

260 - up by 5 (0 to 5)

290 - up by 3 (0 to 3)

-In response to increased student demand for Statistics, additional Statistics classes were offered (Math 110 and Math 110S).

Fall 2017 -> Fall 2018 (increase of 8 sections)

110 - up by 8 (34 to 42)

110S - same (2 to 2)

Spring 2018 -> Spring 2019 (increase of 2 sections)

110 - up by 3 (38 to 41)

110S - down by 1 (3 to 2)

-In response to increased student demand for math support courses, 19 support courses were offered in Fall 2018; in Spring 2019, 22 support courses were offered.

Physics & Engineering:

-Met with California State University and University of California faculty to discuss transfer associates degree in engineering.

-Met with engineering dean of CPP to determine future collaboration.

-Provided faculty hours in STEM center.

MakerSpace:

-Increased number of student members and increased diversity of majors of student members.

-Began to lay groundwork for integration of internship experience presentations with MakerSpace activities and culture.

-Provided workshops and experiences for Basic Skills students, inexperienced members, and Deaf/Hard-of-Hearing students.

STEM Center:

-The STEM center has four STEM counselors that assist with Ed plans, degree and certificate requirements, transfer requirements, career exploration, and connect students to STEM resources.

Notable Achievements for Theme C: Secure Human, Technological, & Financial Resources

Agricultural Sciences:

-The Turf Team, IHSA, and Livestock Show Team received approximately \$16,000 from Associated Students for student conference travel and competitions.

-Received funding through the Perkins Grant in the amount of \$56,500 for Horticulture.

-Awarded the "Gear Up" grant from the Tree Care Industry Alliance Foundation, which provided us with \$5000 worth of power equipment to use in our classes.

Biological Sciences:

-We hired Xavier Lopez to teach non-major's general biology, full-time.

-We hired Sabrina Torres as a full-time lab technician.

Chemistry:

1. Completed the hiring process for 1 new full-time faculty, Carrie Miller, for the 2019-2020 school year.

2. Successfully implemented new data acquisition systems in the Chemistry 40, 50 and 51 laboratories

3. Received augmented funds for supplies, including significant one-time lottery funds.

Earth Sciences & Astronomy:

- The planetarium paid for major upgrades and repairs that cost \$27,000 and were 100% covered by revenue generated by the planetarium.
- We hired 3 new Geoscience adjunct faculty members.

Math & Computer Science:

- Worked with BSSOT Coordinator Sage Overoye to secure funding for co-requisite brochures, co-requisite Faculty Training Days, AB 705 Open House events, 6 faculty that are attending CAP conference, and faculty stipends.
- Funding was secured for August 15-16 Community of Practice.

Physics & Engineering:

- Obtained 5 new additional laptops for 11-2101 classroom.
- One time lottery money to support ENGR
- Awarded Stars of Excellence funding for robotics team participation in international event.

MakerSpace:

- Applied for Immediate Needs money from President Scroggins and was awarded funding for June, August and September
- Arranged for continued staffing with appropriate personnel
- Received donations from other campus areas and from individuals to benefit student members

STEM Center:

- The STEM center has 20 new PC laptops for students to checkout, to replace 20 older laptops that had been heavily used for five years.

Notable Achievements for Theme D: To Foster an Atmosphere of Cooperation and Collaboration

Agricultural Sciences:

- Participated in the Sustainability summit meeting
- Maintained communication and articulation agreements with Agriculture programs from local high schools and with other colleges, such as Cal Poly.
- Our history of providing tours for Orange County High School Ag Programs has resulted in an excellent relationship with the Orange County Farm Bureau.

Biological Sciences:

- Exploratorium and Meek Collection are open to the public the first Friday of every month. These facilities were also used in high school outreach programs.
- Loni Nguyen, Diana Churchill and Laney Whitlow attended the Community College Bio INSITES meeting to promote biology education research by community college faculty.
- Wildlife Sanctuary in collaboration with Inside the Outdoors of the Orange County Department of Education in giving tours to elementary school students; Wildlife Sanctuary Earth Day events had over 100 attendees.

Chemistry:

- Supported activities of A.P.P.L.E. (Association of Pre-Pharmacy Learners and Educators)
- Planned and hosted activities for Family Science Festival, where over 200 students from the community attended.
- Successfully offered the General Chemistry Competition for the second year in a row with funding from the department as well as Associated Students.

Earth Sciences & Astronomy:

- Geology faculty were in communication with geology faculty from Cal Poly Pomona and Cal State Fullerton to investigate 2YC-4YC collaborations
- Working with aeronautics program and gaming and virtual reality program faculty members on creating Mt SAC virtual helicopter tour of campus
- SAGE 2YC: Faculty as Change Agents: Supporting and Advancing Geoscience Education in Two-Year Colleges; two teams in our department (Anders/Boryta and Walker/Mrofka).

Math & Computer Science:

- English, reading, AmLa, and math faculty collaborated to present their new placement models and co-requisite courses at:
- Counseling meeting (September 12, 2018)
- Academic/Student Services Master Planning Summit (November 12, 2018)
- Outcomes Assessment Summit (January 23, 2019)
- Counseling meeting (February 20, 2019)
- ACCESS Advisory Board meeting (April 9, 2019)
- Academic Student Services Critical Information Summit (May 3, 2019)
- Numerous campus-wide implementation meetings (SSSPAC, SP&S, Multiple Measures Task Force)
- Collaborated with academic support centers via the Academic Support Group to improve the tutor hiring and training process, as well as better market tutoring centers across campus.

Physics & Engineering:

- Attended department meetings for Manufacturing and Astronomy and many others to build bridges between departments and MakerSpace.
- Met with chemistry faculty to co-develop chemistry for engineers course.
- Faculty continue to serve on several campus-wide committees.

MakerSpace:

- Increased and ongoing outreach to faculty, staff, administrators and students about MakerSpace, including workshops, meet ups, presentations and class visits in MakerSpace.
- Hosted regional MakerSpace workshop to support development and implementation of MakerSpaces at other institutions.
- Presented at national conference hosted by NAACE ("make/SHIFT") and will present at national conference this July at University of La Verne.

STEM Center:

The STEM center has partnered in several on and off campus STEM or STEM related events including the Mountie Mentor Hidden Figures movie and female scientists of color panel, the Kepler dinner (partnering with ES and A department), the field trip to the Von Karmen JPL lecture (partnering with ES and A and PENG departments), the Veterans Resource Center CHEM boot camp, informal STEM career talks with faculty such as Dr. Romans (partnering with ES and A department), transfer presentations from Project RAISE at CSUF, a women's science panel (Biology and SWE club collaboration), and held workshops to promote successful applications for summer research or internships.

- The STEM center has also advertised multiple STEM speaker events and workshops for clubs such as APPLE and Caduceus, and has promoted on campus STEM events.

Closing the Loop - Analysis of Progress on College Goals: The Natural Sciences Division has made excellent use of the resources allocated to it from Instructional Equipment funds, Perkins Funds, Strong Workforce Initiative funds, staffing, and lottery funding. The division has continued to grow while taking advantage of the hundreds of thousands of dollars allocated to serve the needs of students. Funds purchased critical lab equipment upgrades in many areas, provide more opportunity for hands on training in CTE areas, and also to better support the students and faculty.

Updates on Division Goals:

Ongoing/Multi-Year Goal Culture of Assessment: Continue to encourage and support a culture of assessment across the Division, encouraging data driven decisions that result in changes in instruction.

The Division's approach to assessment has been redefined by AB 705. Departments continue to make data driven decisions that result in changes in instruction. A perfect example is the implementation of the multiple measure placement for Math. The Math department has rolled out two Phases, one in the summer of 2018 and one in the summer of 2019 designed to guide students toward the appropriate courses. The chair, in consultation with the deans is carefully monitoring enrollments to ensure access to high demand courses while gradually reducing sections of lower level courses such as MATH 50 and 51.

Ongoing/Multi-Year Goal Support for Events: Support department, campus, and community events such as, Debbie Boroch Science Day, Caduceus Club Health Professions Conference, Kepler Scholarship Program, Farm Day, Robotics competitions and events, and other events sponsored by one or more departments within the Division.

Events such as Debbie Boroch Science Day, Caduceus Club Health Professions Conference, Kepler Scholarship Program, and Farm Day continue to be extremely successful and well attended each year. In the fall of 2018, The Randall Planetarium celebrated its 50th anniversary and the event was well attended. The Kepler Scholarship program raised approximately \$12,000 and was once again a big success. Finally, Farm Day brought in a record 3,000 participants! All events were well supported by the Division and

will continue to be an ongoing goal of ours.

Ongoing/Multi-Year Goal Manage Resources: Effectively manage resources within the Division, such as Wildlife Sanctuary, Agriculture Farm, Meek Museum, Redinger Exploration Center, Randall Planetarium, Observatory Dome, Ag Literacy Trail, and develop program to recycle 100% of the College's green waste and manure.

Effectively managing resources within the Division, such as Wildlife Sanctuary, the Farm, Meek Museum, Redinger Exploration Center, Randall Planetarium, Observatory Dome, and Ag Literacy Trail is a lofty goal. Through the support of the college, donors, guests to the Planetarium and lottery funds, the Division has done an excellent job at managing the resources for some of Mt. SAC's most prestigious attractions.

Ongoing/Multi-Year Goal STEM Center: Increase student success and achievement in science, technology, engineering, and mathematics (STEM) courses, particularly for underrepresented students, by continuing to support the STEM center.

The STEM Center has been a tremendous success in terms of attendance; it is constantly packed with eager students. In fact, the center could really use a much larger space. As we plan for the new science building, we must consider that an ideal location for the STEM center would be on the ground floor much like the MARC and TMARC in building 61. In terms of tracking student success, a great deal has happened this year. In collaboration with the School of Continuing Education, noncredit faculty members are tutoring in the STEM center thus allowing the college to collect apportionment for those hours. Additionally, the STEM project expert and the faculty coordinator have been working with the research department to collect data regarding success and persistence. (see attached documents) Through outreach activities, the center is making sure to target underrepresented students.

Ongoing/Multi-Year Goal Enrollment Management: Continue to respond to student needs for courses within the Division through targeted growth and effective enrollment management.

The Division continues to respond to student needs for courses through targeted growth and effective enrollment management. There are a couple of internal and external factors having a major influence.

The implementation of AB 705 and the swift responses by the Math department effect enrollment management. As more students place in higher level Math courses, the department chair in consultation with the deans have strategically monitored offerings to ensure we are meeting needs. While offering more sections of courses like Math 110, we are careful to still provide enough sections of Math 50 and 51 for students who chose the courses to brush up on their skills in order to be successful in higher levels.

Next, growth is limited by space and availability of qualified adjuncts. For example, Chemistry is operating at capacity within current facilities. As the college celebrates the passing of Measure GO, it is important to realize the growth potential in the Natural Sciences division. As such, the new Science Building should remain a priority in planning. The sooner departments like Chemistry have more lab space, the sooner the college can growth in those areas in order to meet demand for students.

Ongoing/Multi-Year Goal Cutting Edge: Develop, support, and implement innovative programs for students utilizing cutting-edge equipment and technology.

The Division continues to develop, support, and implement innovative programs for students utilizing cutting-edge equipment and technology. Examples include the Mountie Maker Space, Histotech, Robotics team, and the Planetarium.

Ongoing/Multi-Year Goal Undergraduate Research: Support undergraduate research across the Division by providing on campus opportunities as well as collaborative experiences with four-year colleges and universities.

The Division supports undergraduate research across the Division by providing on campus opportunities as well as collaborative experiences with four year colleges and universities. Examples include new curriculum such as STEM 99 which allows students who have previously taken other 99 courses such as BIOL 99 to continue their research for a second semester. Students in ASTR 99 had the opportunity for an internship-type experience with JPL. Currently the Physics and Engineering department has a 2+2 agreement with Cal Poly. Finally, the NSF STEM T2P continues to be a huge success.

Ongoing/Multi-Year Goal MakerSpace: Support ongoing success of the MakerSpace. Support an advisory committee which reaches out to community partners and the public to make the MakersSpace a truly collaborative learning environment for students. Support curriculum development of skills badges so that makers can earn recognition for demonstrated skills achieved. The Division supports the ongoing success of the MakerSpace. An advisory committee which reaches out to community partners and the public to make the MakersSpace a truly collaborative learning environment for students has been created. A next step is to support the development of skills badges so that makers can earn recognition for demonstrated skills achieved. PIE for the MakerSpace was very thorough this year and is once again housed in the Natural Sciences division. The division continues to support the ongoing success of the space by providing both faculty and students who regularly use the space as well as taking highly ranked needs forward to the Instruction team.

Staffing:

- Six new full time faculty members were hired (Math-2, Chemistry-1, Biology-1, Physics-1, Engineering-1, + 1 failed search in Micro).
- The Admin staff is fully in place. The Division seeks to make the Admin 1 position full time in the future.
- The Coordinator of the STEM Center is still be funded by categorical funding. The NSD strongly supports institutionalizing this position as soon as possible. In order to support this effort, we are now collecting apportionment in the STEM center by having faculty members serve as line of sight tutors paid at the noncredit, non-teaching rate.

Outcome Assessment:

- 100% completion of Student Learning Outcomes, establishing Program Level Outcomes (PLOs), and mapping course level outcomes to PLOs and Institutional Level Outcomes (ILOs) was achieved and maintained.

Key Examples by Department:

Agricultural Sciences:

- Three teams of four students competed in the STMA Student Challenge in Phoenix, AZ. The teams placed second, third and fourth. This is an annual event and next year it will be held in West Palm Beach Florida, so we will need ongoing support. Brian Scott and Chaz Perea are the Turf Team coaches.
- Jennifer Hinostroza was the advisor for the Horticulture Club again this year. The club competed in the South Coast Plaza "At Home in the Garden" show, which provides them with valuable experience putting together a landscape.
- We provided 403 students with opportunities to gain valuable work experience this year - both on campus and with off campus employers. As of April 1, 262 students had successfully completed their work experience.

Biological Sciences:

- We have obtained document cameras and are using them in lab.
- AAT has been EDC approved.
- We have obtained the condor skeleton.

Chemistry:

- Prof. Iraj Nejad was approved for a sabbatical in 2019-2020 to work on finding funding for development and testing of new experiments and techniques.
- An ELMO was purchased and installed in 7-1201 allowing instructors to show step-by-step problem solving, or exhibit student work. This impacts approximately 12 sections of classes scheduled in that room (300 students) per semester.
- Hand readers were replaced by FOB readers in the chemistry stockroom, reducing difficulties in accessing the stockroom. There are still significant facilities problems that arise every time there is rain and the stockroom partially floods if tarps and buckets are not employed.

Earth Science & Astronomy:

- An advisory committee was put together for the Geotech certificate, the committee met and approved submitting the certificate, a third course for methods was created, and the department is waiting to hear from EDC. The certificate is at stage 5.
- The department does now have a central repository for SLO data for all of our classes. Faculty is trying to enter data there every time it's collected. We have decided as a department to collect SLO data the semester before any course is resubmitted to curriculum.
- The weather station has been purchased and delivered, but has not yet been installed or utilized.

MakerSpace:

- The overhead steel structure which will support the roof has been completed.
- We have an account with Badgr, a free online electronic badging company, and have awarded almost 20 badges. With a little graphics design, this is a simple process.
- Although the MakerSpace does not yet have a steady and reliable stream of funding for the future, the MakerSpace Team has applied for:
 - * an NSF AISL grant, applications are still being processed, 5 year grant will fully fund the MakerSpace
 - * Strong Workforce through the Engineering Dept, will fund approx 2-3 student workers in the MakerSpace
 - * Associated Students grant for supplies to be provided for student work
 - * Immediate Needs funds, granted for June, August and September 2019, minimal staffing and reduced activities.

Math & Computer Science:

- Broken projector screens were replaced by new manual screens through Presentation Services.

- The request for \$50,000 for the instructor workstations was resubmitted through the instructional equipment prioritization process in June 2018. Due to the reduced funding at the Instructional level, the workstations were not approved.
- In addition to the Math Information Tables, a corequisite brochure was created and widely distributed across campus.

Physics & Engineering:

- The second lab tech position was approved BUT without sufficient budget to actually pay for a full time position. Our Dean will be taking this position request forward again with a budget request of \$90000-95000 to cover salary and benefits.
- Applied for SWF funding to support engineering technology. Our requests have been prioritized at CTEAC but not currently funded for 2019-2020.
- Still no permanent Engineering Supply Budget.

Tracking Conditions and Trends: a. External Conditions Analysis: Many external conditions impact the Natural Sciences Division:

- The new funding formula will have a huge impact on the college. Programs must pay even closer attention to completion rates and adjust scheduling, advising, and student support accordingly. A stronger connection to Student Services is needed in order to obtain access to Ed Plans. Finally, Guided Pathways will play an important role in helping students choose a path, enter the path, stay on the path, and reach their intended goals.
- With the passing of AB 705, placement in MATH courses has been totally overhauled. Thanks to the hard work of our faculty, Mt. SAC is once again in the lead on adapting to such external conditions. The math faculty have created co-requisite style courses to provide support for students who feel they need it. They have been instrumental in the creation of the new AQ (Assessment Questionnaire), designing easy-to-follow messaging for student both online and in print, and have planned professional development training for faculty who may be teaching courses they haven't taught in a while.
- Increased hiring at local colleges has impacted our ability to find quality adjuncts in several disciplines. Our ability to meet student demand is often compromised by a lack of qualified candidates. We should expand our search areas and suggest advertising and publicity for adjunct hires to HR to increase the number and quality of applicants in our adjunct pools.
- Advisory committees in CTE programs define the industry needs and standards that we must adjust to in order to keep our programs relevant and insure student success when they enter the industry.
- Dual enrollment at local high schools is both an internal and external condition that impacts departments significantly. It adds tremendous growth potential while increasing staffing demands and the need for clerical support to the departments.
- Increases to the minimum wage impact departmental support provided by student workers. Not only have the departments grown, thus needing more support, budgets have not kept up with the salary increases in order to supply the support.
- Rapid advances in technology change the way industry functions and the way students learn. We must stay up to date with these changes and secure funding to maintain appropriate equipment and educational infrastructure.
- Lack of preparation continues to create challenges for students to successfully complete our courses and programs. We continue to look for ways to intervene early and support students with additional resources to help them achieve success.
- As students shop colleges for the best fit and programs, we need to be mindful of the distances they travel and the challenges they face. Where practical and pedagogically sound, we must explore increasing our online course offerings.

There are several external impacts that affect departments individually.

Agricultural Sciences:

- We need to meet the requirements of the industries that we serve, as defined by our advisory committees (Registered Vet Tech / Animal Science, and Horticulture).
- Some students are underprepared for even beginning program courses, and are not successfully completing courses because of lack of foundational knowledge.
- We are now required to meet requirements for USDA compliance for the care and use of agricultural animals in teaching, which is adding new requirements for how we run our classes and our units.
- Minimum Wage will continue to increase over the next few years, and there has been no increase in our labor budget. Our labor budget was already insufficient before the wage increase.
- Rapid advances in technology are being made on a constant basis, changing the way the industry functions. It is critical that we stay up to date with these changes and technology in order to keep our program relevant.

Biological Sciences:

- Space limitations have made it more difficult to add sections in Fall and Spring, but we still have many courses with unmet student demand.
- The state has asked the college to develop CSU Transfer degrees. We have developed an AAT Anthropology, an AST Biology and

an AST Public Health in response.

- The teaching of evolutionary biology continues to be challenged by creationists, including those ascribing to intelligent design. Other tenets of biology such as the safety and efficacy of vaccines and climate change are being challenged by other pseudoscientific beliefs.
- Global biological changes require increased biophilia and a more robust scientific literacy among the public.
- There is decreased support for the sciences at the federal level and an increased need to educate the public about basic scientific facts, critical thinking, and how science works as a discipline.

Chemistry:

- Green chemistry principles are driving the usage or removal of certain chemicals, and the need to find alternative chemicals and processes as replacements
- State funding fluctuates, making it difficult to predict enrollment needs and to budget effectively
- State of California is offering the opportunity for community colleges to offer bachelor degrees, which may require developing and offering new courses
- Accreditation requirements and frequent changes to Outcomes Assessments requires significant additional time and effort
- OSHA & Cal/OSHA standards for laboratory safety must be considered for the laboratory curriculum

Earth Sciences & Astronomy:

- Change in enrollment: Possibly due to the change in economy, our department along with the entire campus is experiencing lower enrollment. This drop in enrollment has hit our night classes especially hard. It seems as the students who traditionally would have enrolled in the night classes are opting to take online classes instead
- Our academic calendar is not in line with other surrounding schools. Starting this academic year, Cal Poly Pomona has switched to semester system from quarter system. Our lower enrollment in Winter intersession and Spring semester may be related to their calendar change. Perhaps the college should consider changing our calendar to better align with the other local schools.

MakerSpace:

- Our advisory board employers have told us that they want employees and interns who know how to “roll up their sleeves”, jump in with a group, then plan and attack a problem in a very functional and effective manner to work towards an appropriate outcome.
- Among all private sector industries, manufacturing companies (which by definition create items) have among the highest average tenure of workers, one of the lowest employee turnover rates and the average manufacturing worker in the U.S. earns more than the average employee working in other industries.
- The Mountie MakerSpace is at the core of creating a pathway for 21st century employees, providing a place to practice technical skills and also to foster soft skills, like collaboration and project planning.
- CCCMaker grant funding expired in May 2019. This means that the MakerSpace will close if additional funding is not found, and the current renaissance of project-based learning and community collaboration will be lost.
- As we continue, we will bring in more students, faculty, staff and community members, encourage more interaction and mentoring, and reach out to incorporate project-based learning into as many courses across the campus as we can. We will need to expand our facilities somewhat and will need some increased staffing in order to accomplish this.

Math & Computer Science:

- Increasing demand for transfer-level math courses.
- Decreasing demand for developmental math courses and LERN 48/49 courses.
- Increasing demand for computer science courses.
- AB 705 implementation will impact placement of students matriculating from high school. Under AB 705, students must complete a transfer-level math course within two primary semesters.
- AB 1805 will require us to inform all students of their "rights to access transfer-level coursework."

Physics & Engineering:

- Increased demand for engineering technicians. Growth of automation in local economy requires more technology workers.
- CPP has transitioned from a quarter to semester system with significant curricular changes.
- Increased numbers of students interested in engineering careers. Engineering majors are more impacted at 4 year institutions so there is less availability for transfer.

-ASSIST is not being updated leaving a gap in transfer information. Special admission requirements for impacted engineering majors.

-Increased desire from 4 yr schools to develop partnership transfer programs.

STEM Center:

-Our sole funding is based on state categorical funds through the Student Equity grant. These funds have been merged this year with several prior grants including Basic Skills, Student Equity and SSSP. This is changing the fund allocation to programs supported by them, and also changing the funds and reporting on campus.

-The state funding formula is changing and requiring more students to be successful over the next several years. This is requiring more student support in centers such as the STEM center to assist students in course completion, program retention, and degree and certificate planning with our Counselors.

-STEM fields are highly desirable, but STEM courses are highly impacted, and require high hours on campus including lab times. Students struggle with time management, getting courses, awareness of the time required in lab courses, and are under pressure to succeed.

-Multiple Measures has placed more students into the STEM pathways instead of prerequisite STEM classes. This is changing the dynamics of what students need for support when entering college, and when they come to the STEM center.

-Campus has not had funds available for construction or remodeling of a new STEM center. Construction projects have been funded off bonds; the STEM center was not one of the projects. With the passage of the recent bond, there may be funds available for the STEM center.

Tracking Conditions and Trends: b. Internal Conditions Analysis: Several internal conditions are similar for most, if not all of the departments in the Natural Sciences.

- Classroom space is limited for both lecture and laboratory classes. Biology and Chemistry are closest to full capacity, but Physics and Math are not far behind.

- Supply budgets have not increased to keep pace with growth of sections and inflation of costs. The last two years, a generous augmentation of Lottery funds has made this ongoing problem survivable, but when the Lottery funds are not available, we must have increased supply budgets in order to maintain the number of sections offered in Biology, Chemistry, Physics, and Agriculture (RVT, especially). There should be an automatic augmentation to supply budgets as sections added. For example, if the approximate cost for running a particular lab is \$800 and a department adds two more sections of that lab, \$1600 should be added to the supply budget.

- Student worker budgets have not kept pace with increasing minimum wage or increase of workload due to increased numbers of sections.

- Full time hiring across the region has put an even greater strain on our ability to find qualified adjuncts to meet our staffing demands for additional sections. Because we are delving deeper into our hiring pools, continued and increased support for adjunct mentoring and professional development for adjuncts is needed.

- Replacing aging technology is an ongoing internal need that must be routinely accomplished. The reliance on computers and computer based classroom technology makes a replacement cycle for all labs and classroom computers a must.

- The STEM center needs increased funding for the coaches and staff. Moving the release time costs of faculty and the Coordinator's salary to the general fund and out of equity funding will resolve much of our budget woes and achieve maximum benefit for our students.

- In many areas, particularly CTE, professional development (Travel and Conference) money is needed for classified staff.

Individually, departments noted other internal conditions as well:

Agricultural Sciences:

-The AVMA is requiring that we have an application process for our RVT program, but the curriculum committee at Mt. SAC will not approve the application process even though other California Community colleges with similar programs do require applications.

-We have no district funding for student lab assistants, but AVMA has a requirement that we have multiple lab assistants in each class (based on the number of students enrolled.)

-Although equipment like printers, copiers, scanners, and fax machines are a necessary part of completing our jobs just like computers are, this equipment is not supported by the college in the way that computers are. This equipment breaks and becomes obsolete, but there is no scheduled replacement for these items.

-Many of our laboratory areas are not handicap accessible, and the number of handicapped students in our classes has been increasing.

-Due to lack of permanent animal science personnel, we were unable to breed the swine in a timely manner, which left us without a the animals required for labs. This nearly caused the cancellation of the Swine Production class, but we were able to

use piglets at Cal Poly for some activities. Although we didn't have to cancel the class, hands-on opportunities for students were limited.

Biological Sciences:

- Though we have been able to add sections to meet student demand in many areas, we still have many courses which cannot meet student demand. We are increasingly space-limited and will no longer be able to grow to meet student demand without additional lecture and lab facilities. E.g. Fall 2017 our lecture rooms are utilized during 58 out of 60 possible MW or TR time blocks for the popular 9:45, 11:30 and 1:15 class start times.
- Our department is unwilling to sacrifice quality to meet enrollment demands. So far we have been able to find top quality adjunct faculty, however, with the increasing number of full-time openings around the state, this is becoming a greater challenge.
- There continue to be unmet needs for instructional equipment and maintenance of existing equipment. In particular, the lack of a process for replacing aging technology such as classroom computers is an ongoing problem.
- Funding for SI positions has not been sufficient to meet the number of sections that could benefit greatly from having an SI. This is true even if SIs are limited to courses with lower success rates.
- Department student worker budget has fallen behind department needs due to increases in minimum wage and due to growth in sections of courses that benefit from TA's.

Chemistry:

- The Departments desires to maintain a modern, rigorous and consistent lecture and lab curricula
- High demand for our courses has created hiring, scheduling and budget challenges.
- Inadequate facilities to accommodate our recent growth. We are operating near or at maximum capacity for most of our lecture and laboratory classrooms. Our dedicated lecture classrooms for CHEM 10, CHEM 40, CHEM 50 and CHEM 51 are reaching maximum capacity. We are operating our labs near 100% capacity as well, especially in Chem 40, 50, and 51. We have been unsuccessful in scheduling CHEM 80 or CHEM 81 or CHEM 20 classes into appropriately equipped lecture classrooms.
- Room 7-2123 is currently underutilized because it is not properly equipped to safely run organic lab classes.
- Insufficient College support for interviewing, hiring, mentoring, training and evaluating the large number of adjunct faculty required to teach our courses. The process generates a considerable workload for full-time faculty. The Department had 36 adjunct faculty that were supervised by 14 full time faculty. Four of those full time faculty are probationary who must also be mentored, trained and evaluated.

Earth Sciences & Astronomy:

- College equipment budget was non-existent in 2018-19. We received replacement computers for some of our aging classroom laptop carts, but no other equipment items were purchased.

MakerSpace:

- The Architecture, Engineering and Engineering Technology programs have designed their curriculum around a project-centered model that has at its heart students collaborating with faculty and the community to make tangible things.
 - Access to a MakerSpace as an independent, open central hub that enables collaborative project-based learning, is essential for students to develop 21st century skills. Teaching objectives can be met via project-based assignments completed in the MakerSpace. Student outcomes can be enhanced by providing a community of practice where students can learn from peers, engage in self-directed learning, and be exposed to mind-sets that foster the more nebulous qualities, such as those of a lifelong learner and effective communicator.
 - The MakerSpace also fills a critical role of helping the community to see Mt. SAC as a valuable resource by providing a location for community-serving programs, including those pushed out from other areas of campus by the pressure of credit programs.
- Current demand for MakerSpace utilization from contract ed, continuing ed and credit programs is growing and the MakerSpace staff and resources are having a hard time keeping up with demand.
- CCCMaker grant funding expired in May 2019. This means that the MakerSpace will close if additional funding is not found, and the current renaissance of project-based learning and community collaboration will have no home. As we continue, we will bring in more students, faculty, staff and community members, encourage more interaction and mentoring, and reach out to incorporate project-based learning into as many courses across the campus as we can. We will need to expand our facilities somewhat and will need some increased staffing in order to accomplish this.

Math & Computer Science:

- Total number of credit sections (Math + CS) reached 687 (Summer/Fall/Winter/Spring) for 2018-19, exceeding 2017-18 levels of 680 sections offered.

- Total credit enrollment at census exceeded 2017-18 levels: In 2018-19, 18,520 students were enrolled at the first census, versus 18,199 students in 2017-18. Data from SSR0039-A.
- Initial course offerings of Math 260 and Math 290 started Fall 2018. These courses were in high demand even during intersessions; the last Math 285 was offered Fall 2018.
- Math 51A, 51B, 61, 70S, and 71X will be placed on hold starting Summer 2019. A decision whether to deactivate these courses will need to be made in order to be reflected in either the 2020-2021 or 2021-2022 college catalogs.
- Initial course offerings of Math 11, Math 14, Math 15, and Math 16 will start Fall 2019.

Physics & Engineering:

- The physics and engineering program has experienced explosive growth & students continue to be successful on transfer.
- Mt. SAC continues to be the largest engineering transfer institution to the CSU system.
- SWF proposal for engineering technology was not funded as a result development activity in engineering is stalled.
- Math department changes effect course prerequisites.
- Facilities are not adequate. Rooms lack appropriate lighting, modern AV systems, and seating.
- The division lacks sufficient administrative staff to support the department.

STEM Center:

- STEM center funding currently is only a portion of the State Equity grant funds; this is changing as we move to the consolidated student support programs funding. There is no institutional budget for the STEM center, only the categorical grant funds.
 - Data tracking has been a challenge in multiple ways. We have transitioned from a computer sign in without a swipe system to a computer swipe system. We have had our courses re-coded from one data collection system to another; and then they have been changed within the swipe system to become a non-credit study lab.
 - Once a non-credit study lab, we have changed the CRNs throughout the semester. This makes it very challenging to extract data, and to know where to find the STEM center data.
 - The STEM center does not have a budget line to purchase supplies or instructional equipment. Students come into the STEM center and request dry erase markers to use on the white boards, as well as instructional supplies such as models and microscopes to study for their classes. There are no funds to repair equipment such as the microscopes, and there is no replacement plan for models, slides, and other instructional materials as they age and break.
 - The STEM center also does not have a good way to supply students with current text books; most are donated to the STEM center by faculty members, but this is not consistent for every course that the students request, and are not always the current editions or authors being used in the classes.
- Equipment such as lounge furniture, shelving, chairs, storage shelving, and tables have all come from campus salvage or donations.

Tracking Conditions and Trends: c. Program Planning Dialogue: Overall, the Natural Sciences Division has experience a slight drop in enrollment. Despite a lower number of students enrolled, we are supporting students across our disciplines, while maintaining high quality programs evidenced by our success and retention rates. Worth noting is that from Fall 2017 to Fall 2018, we increased retention rates nearly 3%. Students in our CTE programs requiring national exams (RVT, HT, and HTL) for employment have consistently outperformed the national average. This provides evidence that our programs set the standards for excellence.

(Data Source CCCC MIS)

Enrollment:

2017 Winter: 4,267
 2017 Spring: 19,797
 2017 Summer: 3,941
 2017 Fall: 20,456
 2018 Winter: 4,403
 2018 Spring: 19,584
 2018 Summer: 3,759
 2018 Fall: 20,075

Success:

2017 Winter: 70.8%
 2017 Spring: 61.9%
 2017 Summer: 69.9%
 2017 Fall: 59.6%
 2018 Winter: 72.4%

2018 Spring: 61.5%
2018 Summer: 68.9%
2018 Fall: 59.4%

Retention:

2017 Winter: 88.8%
2017 Spring: 83.1%
2017 Summer: 86.9%
2017 Fall: 82.8%
2018 Winter: 89.8%
2018 Spring: 82.8%
2018 Summer: 86.7%
2018 Fall: 83.6%

Individual Department Programming Decisions:

Agricultural Sciences:

-We have been working to begin implementation of some of the plans that we made during the educational and facilities master planning process last year.

Biological Sciences:

-We have offered additional classes in our new degree in public health which includes 6 new public health courses. We have offered PUBH 22 Introduction to Epidemiology, 26 Introduction to Global Public Health, 28 Public Health and Bioethics and 29 Public Health Microbiology so far.

-Our new Anthropology classes including Anth 6 Linguistic Anthropology, Anth 15, 16 and 17 Peoples and Cultures of the World, Anth 5 H Cultural Anthropology Honors and Anth 50 Introduction to Science Technology and Society have all been approved.

-We have also written new curricula in Zoology (Zoo 3) and a new Public Health independent study course (PUBH 99), and a new lab 99 course (STEM 99).

-Our ability to offer courses to meet student demand is increasingly limited by our lecture and lab classroom space. We have needed at least one additional room to offer desired sections each semester of late.

-Our AST in Biology has been approved by the EDC. Our certificate in anatomy prosection has been approved. Our AAT in Anthropology is awaiting approval at EDC. Our AS Biology has been tabled by EDC and will be revisited in the Fall. These will use existing courses, staff and facilities.

-Our effort to renumber our major's courses was put on hold pending approval of our AS Biology.

-We plan to develop Histotechnology application and selection process.

-We have developed a bachelor's degree in Histotechnology and we are waiting for the state to expand the number of bachelor's degrees offered at community colleges. We are appealing to Sacramento to consider this program proposal. This would include the recently approved course Anat 38 Pathophysiology, and would require new courses HT 22 Laboratory Management and Chem 120 Biochemistry. We likely would need additional adjunct faculty to support this program. We likely would need additional lecture facilities to support this program, as an HT lecture currently taught in the HT lab. If this program is developed and approved, we may need to move existing HT lectures out of the lab room into lecture rooms to make room for more HT lab sections.

-We plan to develop a Nature Center for the Wildlife Sanctuary and enhancements to the expanded Wildlife Sanctuary. These are part of facilities master planning. We finally received our Sanctuary fencing around the expanded Sanctuary. The expansion of the Sanctuary increases our need for a Sanctuary Technician to help maintain the Sanctuary. The Petersen Amphitheater needs replacement seating and a new sound and lighting system.

Chemistry:

-Much of the external and internal conditions on our department haven't changed significantly. The one major change that is still ongoing is AB705 which will have an unknown effect on our department.

MakerSpace:

-The Mt. SAC MakerSpace is a gym for creators, making 21st century tools available to facilitate ideation and creation. The mission of the Mt. SAC MakerSpace ("Mountie MakerSpace") is to drive student success and innovation by creating an environment where Mt. SAC students, staff and the community can collaborate on the creation of tangible items and entrepreneurial ideas.

-The MakerSpace serves as a hub for project-based learning across instructional areas by providing the tools, mentors and space to complete practical and artistic projects that emphasize the skills required for 21st century employment.

-The existence of these spaces on other campuses has led to many unique collaborations among colleagues who may not have otherwise had the opportunity to work together, including the development of multidisciplinary courses. The open nature of these spaces promotes an intentional collision of random ideas, a design structure that has benefited many maker members and many industries.

-The CCCMaker grant year 2 ended May 2019, so new funding sources, including campus funding, are needed to continue operation of MakerSpace and to continue to support Mt. SAC students. As we continue, we will bring in more students, faculty, staff and community members, encourage more interaction and mentoring, and reach out to incorporate project-based learning into as many courses across the campus as we can. We will need to expand our facilities somewhat and will need some increased staffing in order to accomplish this.

Math & Computer Science:

-With the release of the July 11, 2018 AB 705 guidelines, the Math Department unanimously approved Phase II of the placement and support recommendation system which will grant open access for all students to Math 100, Math 110, Math 120, Math 130, and Math 150. In addition, Math 51A, Math 51B, Math 61, Math 70S, and Math 71X are being phased out since those classes are no longer necessary given the access that students are given with Phase II. A four-hour AB 705 Open House was held August 23, 2018, which offered a forum for math faculty to discuss the Phase II model. A second four-hour AB 705 Open House was held March 8, 2019, and was advertised to the Natural Sciences division as well as the Counseling Department.

-Eric Kaljumagi joined the Math & Computer Science Department from LERN. Eric was elected as CCA President so he will not be teaching for the department for at least the next two years. Jannie Ma is currently still teaching courses in LERN. There is no firm timetable on her transition to Math. Martha Hall is still working on her Master's Degree and is still slated to join the department beginning Fall 2020.

-Jennifer Turner completed the conversion of the Math & CS website so that it would be accessible to the visually impaired. This required her to re-do the website so that it would be readable by ReadSpeaker.

-Math continued its ongoing relationship with Bridge and Pathways to Transfer.

-Rene Pyle and James Abbott discussed possible changes in the roles of the MARC and T-MARC beginning Fall 2019. With the number of developmental courses decreasing and the number of transfer-level courses (especially statistics) increasing, they are looking into possible changes for student usage. They will be monitoring the number of students using the MARC and T-MARC during Summer 2019 and early Fall 2019 to determine if any changes need to be made.

-Dual enrollment courses were held at IPoly High School and Bonita High School.

-The future of the Math Success Lab (MSL) was discussed with Audrey Yamagata-Noji.

-Discussion for the need for an additional computer lab facility and/or an additional CSCI lab in building 61 continued. 61-1420 continued to be discussed as a possible new computer classroom. Another idea is to use 61-3311 for computer science classrooms since that computer lab appears underutilized.

Physics & Engineering:

-PENG is successfully offering more than 50 distinct lecture and laboratory sections. There is more demand for credit courses in physics and engineering than there are rooms, staff, equipment, and qualified faculty.

-The department has a strong legacy of successful transfer as the top engineering transfer program in California and the department is always looking to improve retention and success.

-The continued success of the robotics and rocketry teams and their impact on student research and student transfer is a point of pride for the department.

-The continued integration of engineering program courses with the MakerSpace is having a positive effect on engineering program outcomes. There is strong demand for certificated engineering technicians across several engineering disciplines and the department is poised to support students in their workforce aspirations.

-The department has been fortunate to receive significant one time money to support laboratories and course equipment. However, there are insufficient resources to sustain the current levels of course offerings and student activity.

-The PENG department lacks resources to complete any additional work on workforce preparation unless the college elects to support those efforts particularly with staff, and ongoing budgets for supplies and equipment.

STEM Center:

-The STEM center has four major activities. 1. The STEM center is a study space accessible to students for long hours daily. The center has facilities including white board walls, course textbooks, laptops for students to use, and course specific resources such as microscopes, models, and specimens to study. 2. The STEM center provides counseling support for STEM students through Counseling faculty with an office in the STEM center. Students can get printed copies of their Ed plans here in the STEM center. 3. The STEM center provides student academic support through out coaching programs, using peer mentors to help STEM students organize their time, study habits, and notes in order to become more efficient learners, and successful in their subjects. 4. The STEM center provides STEM engagement experiences to both on-campus students (INreach) and to community members and high school students (OUTreach).

Tracking Conditions and Trends: d. Critical Decisions Analysis: The Natural Sciences Division approaches critical decisions from a student centered and data driven perspective. The Department Chairs work together exceptionally well to sort through the facts and come up with solutions that make sense for students and their success. There is a true spirit of collaboration in the division, which has allowed us to make significant changes that will ultimately benefit the college.

Enrollment:

Critical decisions in enrollment management are being made each semester in the division. These decisions are made by Department Chairs and scheduling committees and shared with the Dean(s) for approval. All course-offering changes are driven by enrollment data; the division is trying to continue to grow while becoming even more efficient in selection of course offerings. Math, Chemistry, and Biology classes show immense potential for growth but are bound by space. With the passing of Measure GO, the NSD looks forward to planning the new Science building. We have already set up once a month planning meetings with the departments to discuss need and how we may maximize student service with the new space.

Funding for CTE programs:

The division was strategic in seeking Strong Workforce Initiative funds as well as Perkins funding to support CTE programs. RVT, Histotech, and GeoTech are all programs that will benefit from supply and equipment funds. Labor market data and our Chancellor's Office Star Award for post completion employment rates suggest this will be beneficial for students and the work force. The GeoTech certificate made great progress this year as it is now in stage 5 of WebCMS to be reviewed by EDC fall 2019.

Dual Enrollment:

Faculty and deans have supported the onset of the Dual Enrollment program to allow us to capture growth through Dual Enrollment offerings at local high schools. Currently, we offer Biology, Anthropology, and Math classes. Smoothing out some of the obstacles to dual enrollment will help us achieve our growth numbers and also serve as a recruitment tool for future students. With contributions from the NSD, the Dual enrollment program has realized 300% growth over the past few years.

Hiring Full Time Faculty:

Prioritization of full-time faculty hires is also driven by enrollment data and FT/PT ratios. Our division understands the role faculty play in supporting the success of students both inside and outside the classroom. Maintaining appropriate levels of full-time faculty is critical to managing the ongoing workload that faculty face and to providing a consistently high level of classroom instruction for our students. The NSD was fortunate to hire 6 new full time faculty in 2019: 2 in Math, 1 in general Biology, 1 in Chemistry, 1 in Engineering, 1 in Physics with 1 failed search in Microbiology.

Critical Decisions Made by Individual Departments:

Agricultural Sciences:

-We must constantly make critical decisions to assess the crops we are producing to make sure that we are providing a product that we can sell and an appropriate laboratory environment for our programs. This year we continued to reduce and make other changes to our production at the horticulture unit in

order to allow more space to be used for laboratory demonstration and activity areas. A permanent irrigation lab facility was constructed as a class project in

Mesa Norte. These areas were designated as part of the master plan that we created in 2017.

-We made the decision to dedicate more resources to a better inventory control system for the horticulture unit. Although the system is costly, it will allow our students to learn about systems that they will be using in nurseries.

Biological Sciences:

-We were able to add some sections to meet student demand, mostly by adding in Winter and Summer. This year we have added sections of Anat 10A, Anat 10B, Anth 4 which includes a lab (replacing the old Anth 3 which lacked a lab), Bio 20, Bio 21, and PUBH 24. Year-over-year we also added sections of Bio 6L, Bio

13 and Bio 15, but those were replacing sections lost last year vs. two years ago.

-We are trying to offer our new public health courses at 2 per semester. Enrollment in these has not been as strong as had been hoped, but we have been able to offer PUBH 22, 26, 28 and 29 so far. We have increased sections of PUBH 24 and worked on DL versions of these courses to make these available to students via online offerings in the future.

-Some of our GE courses have been having weaker demand, such as Anth 1, Anth 5, and Bio 15. DL courses in these areas seem to have increasing demand. We have added some Anth 5 and Bio 5 online classes to address this shift in demand.

- We plan to offer Zoology as soon as our AS Biology is approved. This will put increased demand on our lab space.

Chemistry:

- The Department will be pursuing one new FT faculty positions to accommodate growth. This will decrease the tremendous workload created by the interviewing, hiring, training and mentoring the high number of adjunct faculty currently in our Department, allowing the full time faculty to focus more on teaching.
- The Department will refrain from increasing the number of sections due to limited laboratory facilities and lack of available quality adjunct faculty.
- The department will be pursue developing an AS-T degree in Chemistry.

MakerSpace:

- Seeking additional funding sources after funds end in May 2019. The MakerSpace Team has applied for Local Strong Workforce (through the Engineering Dept), applied for an NSF AISL grant, is in the process of setting up the framework to enable collection of apportionment, plans to apply for Equity funding when that opens to new applications, plans to apply for Regional Strong Workforce funds in November 2019, and is actively searching for sources of grant funds and philanthropic funding.
- The Team is trying to integrate making into Mt. SAC culture across the campus, including Student Services departments, ACCESS and Library/Learning Resource departments.

Math & Computer Science:

- Phase II math placement and support recommendation system based on AB 705 guidelines was adopted.
- The math placement tests, Geometry Competency Test, and Intermediate Algebra (Part 1) Competency Test will no longer be offered. This decision is due to AB 705 which prohibits placement of students into courses via placement exams.
- The Math Placement Specialist role was approved by the department to help students without high school records gain eligibility for Math 140, Math 160, and Math 180.
- Students who are seeking an Associate's degree that does not lead to transfer will be recommended to take Math 71, Math 100, or Math 110 to satisfy the Associate's degree math requirement.
- Four new math co-requisite courses were approved (Math 11, Math 14, Math 15, and Math 16).
- Math 51A, Math 51B, Math 61, Math 70S, and Math 71X were placed on hold starting Summer 2019.
- The department will offer two statistics support models: Math 110 + Math 11 and Math 110S.
- Co-requisite courses will be converted to 15-week courses.

Physics & Engineering:

- Pursue an ongoing MakerSpace grant to support campus-wide making.
- Offer all engineering courses year round to support student completion.
- Increase offerings of Engineering Physics courses.
- Obtained a new full-time physics faculty and an replacement engineering faculty.
- Active recruitment of adjunct faculty.
- The department has supported an increased role in campus governance.
- Received guided pathways funding for engineering transfer programs.
- Modified PHYS 1 curriculum.
- Updated PENG curriculum.

STEM Center:

- Financial decisions have been driving much of this planning cycle.
- We have a collaboration with Cal State University, Fullerton through Project RAISE, funded by the Department of Education.
- The STEM center also partnered with the School of Continuing Education to try to collect apportionment dollars as a study lab.
- Driven by budgetary changes, no new coaches were hired in the 2018-2019 year. Some current coaches were moved into supporting students in the highest need topics (ANAT 10A, CHEM 40, CHEM 50) in order to better support the students in more sections of gatekeeper and high failure rate courses. The diversity of courses coached for has decreased, and the total number of sections coached has decreased.

Tracking Conditions and Trends: e. Progress on Outcomes Analysis: Currently, all departments are participating in their outcomes assessment.

In part because of the renewed attention, and in part because of the review of assessment results, our departments have moved to a new, better level of Outcomes Analysis. Faculty are striving to move beyond predictable results from uninspired outcomes and really asking good questions about how to improve their programs and courses.

The quality of the outcomes and assessments has improved greatly, and in many areas--Agriculture, Biology, Math come to mind--faculty are using outcomes assessment to make significant improvement to their classes and programs. Some faculty who were once skeptic, are now believers and are truly using the outcomes process to improve teaching, ultimately benefiting our

students.

Analysis of Curriculum Currency: The new Curriculum Liaisons have done an excellent job of keeping departments on their toes when it comes to updates. (so glad they got rid of that last guy...:) Pre-screening is happening much faster, reminders for responses are sent out more frequently, and both EDC and C & I are approving courses at record speeds. The Chancellor's office granting local approval to districts has had a huge positive impact. The courses in the division are current, and chairs and faculty have been responsive to requests for updates and adherence to timelines. In critical areas like Agriculture and Biology, we have faculty who have contributed to the state standards for C-ID guidelines. This has really helped with the creation or amending of courses to match the state requirements.

The faculty of the NSD have done some amazing work this year. Here are just a FEW highlights:

- We now have the first ever non CTE certificate in Human Prosection.
- GeoTech has their certificate to stage 5.
- Chemistry is pursuing an AS-T and much more.
- We have several new Cultural Anthropology courses including Anth 6 Linguistic Anthropology, Anth 15, 16 and 17 Peoples and Cultures of the World, Anth 5 H Cultural Anthropology Honors and Anth 50 Introduction to Science Technology and Society.
- And much, much more!

The NSD looks forward to the implementation of WebCMS 10.0. There has been talk for a year and a half now and Associate Dean John Vitullo even took part in some of the initial design of the new system. Faculty and managers are eager to try out the new version and look forward to it aiding in streamlining the curriculum process.

Analysis of Division's Plans, Activities, and Resources: The Natural Sciences Division benefits from dedicated faculty who are willing to go the extra mile to meet student demand and prepare students for successful careers or continued academic success. The Deans work extremely well with the Department Chairs to plan carefully and collaboratively for the future.

As one of the areas at the College with potential for continued growth, the Division is in need of more classroom and lab space. We have begun the process of re-allocating our own facilities resources with great success. Both the Biology and Chemistry departments are space bound in terms of growth and are exploring weekend labs and classes to increase offerings. The Math department will also need additional classroom space to grow to meet student demand, particularly in Computer Science--where an additional computer classroom is needed.

The college has recognized our need and moved a proposed lab building up from phase 3 of the Master Plan to Phase 1. We are selecting faculty now to begin the process of discussing the scope of the new building; the larger the building, the better. Initial thinking suggests relocating Chemistry and Physics to the new building and providing enough space--mostly labs, but some classrooms as well to fully house those two departments. The Chemistry space left behind can be converted to Biology, and the vacated Physics spaces can be taken up by Earth Sciences and Astronomy, with Math gaining rooms in building 61 and potentially other spots. If we really want to support student success, the first floor of that new building should house a state of the art STEM Center, with enough space to handle our growing STEM population.

The Agriculture department has spent valuable time crafting an Ag Master Plan that is ready to be implemented when funds become available through bonds or through the state. A clear vision for both the Animal Sciences and the Horticulture disciplines highlights a reorganization of the physical landscape, which is central to our hands-on approach to teaching agricultural science. This plan will change, undoubtedly, but it provides a strong framework to maintain a health Ag department for many years to come.

The Natural Sciences have tremendous community outreach resources in the Planetarium, the Observatory, the Wildlife Sanctuary, the Farm, and the Redinger Exploratorium and B.J. Meek Museum. The college has always supported these resources and the impact has been phenomenal. Over 13,000 students from K-12 schools visited the Randall Planetarium last year. Thousands of elementary age children visit the Wildlife Sanctuary through the Orange County "Inside the Outdoors" program. Our newly developed MakerSpace has the potential to reach a whole new component of our community in a wonderful and collaborative setting. These resources need the continued support and upkeep the college has always provided. We help the college reach out to young students and the community.

The division supports and promotes a host of annual/recurring activities to make outstanding use of its resources: Farm Day, Family Science Day, Fall into AG event, Monthly Stargazing at the Observatory, Planetarium shows year round, The Caduceus Pre-Health Professionals Conference, The Kepler Scholarship Dinner and Lecture, Robotics competitions and Events, Farm Tours for local groups, The Debbie Borocho Science Day, Ag Career Night, The Summer Science Experience, and many others.

The Division has severe budget needs that have been met on an as needs, ongoing basis but have not been formalized in the annual budget. This makes successful planning very difficult and causes a lot of concern and worry in the department and in fiscal services. We need to set realistic budgets for those departments who utilize student workers--particularly Agriculture--and the annual budgets need to be augmented so that we can adhere to them. Supply budgets in all of our departments have not kept paced with either growth of the number of sections or with inflation of supply costs. We have benefited from lottery funds and a very supportive Vice President of Instruction, but those budgets need to be brought to a functional, realistic level. We can't sustain the growth we have achieved without that augmentation. This is a critical need for the near future.