

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

PIE - Natural Sciences Division Manager

2019-20

Contact Person: John Vitullo or Matt Judd

Email/Extension: jvitullo@mtsac.edu / 4517; mjudd@mtsac.edu / 4711

Division Mission Statement: 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.

Summary of Notable Achievements: While many of the Division's traditional successes occurred this year, most of the notable achievements stemmed from efforts made to transition to remote instruction due to COVID-19.

Agricultural Sciences

- Live on student workers as well as classified staff were deemed essential employees in order to keep the plants and animals alive and well at the farm.
- The Turf team won yet another National Championship leaving PENN State in second place.

Biological Sciences

- Most courses were able to transition to TRI.
- Full time Microbiology professor is in progress.
- Histotechnology was one of the first to hold an on-campus class Summer 2020. With a great deal of collaboration between Risk Management, Facilities, faculty and staff 20 students were able to complete their Histology program under an extremely controlled, clean, and safe environment.
- Nearly 1500 take home kits, including microscopes have been prepared for Fall students in BIOL 1, 8. and MIRC 22. Faculty and staff orchestrated a precise system for students register to pick up these kits, agree to all safety guidelines, and to actually drive though campus to receive the materials in a contact free, safe delivery system. High commendation is deserved by Department Chair David Mirman, Administrative Specialist III Ashley Marin, and all of the faculty and staff of this department who truly went the extra mile to serve students.

Chemistry

- Family Science Day was held in Fall 2019 with over 300 participants.
- 100% of courses transitioned to TRI.

Earth Sciences and Astronomy

- Nearly 100% of courses transitioned to TRI.
- Through collaboration between faculty, staff, and Risk Management, students received take home rock kits so that they make complete Geology lab courses.

Mathematics and Computer Science

- 100% of courses transitioned to TRI.
- Debbie Rivers received the Academic Senate Outstanding Faculty Award.
- Scott Guth was name "Carnegie National Faculty" for 2019.
- The Torchbearer Award was given to the AQ (Assessment Questionnaire) Team, which included David Beydler and Debbie Rivers.
- Computer Science will hire a full time faculty member for the first time in over 20 years.

Physics and Engineering

- Transitioned nearly 100% of courses to TRI. In order to do so, faculty members like Phil Wolf spent countless hours recording

videos in our labs to help students better understand the material.

- Received a remarkable amount of grant money including Guided Pathways, NSF ATE (\$600k), and CLL (\$200k)
- Rock star Lab Technician, Maria Vaughn, with faculty input and assistance, assembled and distributed kits for various Engineering courses.

STEM Center and MARCS

- The STEM Center transitioned completely to remote service.

- New Faculty Coordinator Boachi Nguyen has guided the coaches through an outstanding approach to coaching from a distance. A big thanks goes to Krystal Yeo from the SCE for helping us with the transition as well as positioning the center to receive apportionment for the remarkable work done.

- The MARCS have also transitioned 100% to remote service. The techs invented an outstanding system of service that combines both synchronous and asynchronous service. Once again, Krystal Yeo was a tremendous help in the transition.

Closing the Loop - Analysis of Progress on College Goals: Division Goal 1-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 NSD continues to encourage and support a culture of data driven decisions. Chairs carefully monitor enrollments and fill rates in order to make the best decisions for scheduling. All requests including new full time faculty members are made with careful consideration of the data. Recently, Loni Nguyen was appointed Data Coach for the division. For the future, with the help of Loni, the division looks forward to closer data analysis in the areas of success, retention, and equity.

Division Goal 2- Support for Events: Support department, campus, and community events such as, Debbie Boroach 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.

While the division was able to support Family Science Day in the Fall with over 300 attendees, clearly the effects of COVID-19 prevented us from celebrating all the events we normally experience.

Division Goal 3-Manage Resources: Effectively manage resources within the Division, such as Wildlife Sanctuary, the Farm, Meek Museum, Redinger Exploration Center, Randall Planetarium, Observatory Dome, Ag Literacy Trail.

In a year of COVID-19, the management of resources for areas such as the Planetarium took on new meaning. While life on the farm, both plant and animal continues as normal, all other areas are on pause.

Division Goal 4-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 did an amazing job of transitioning to remote service due to the COVID-19 shutdown. New Faculty Coordinator Boachi Nguyen guided coaches to an effective approach to distant coaching.

Division Goal 5-Enrollment Management: Continue to respond to student needs for courses within the Division through targeted growth and effective enrollment management.

Enrollment management has been a challenge to say the least due to the COVID-19 shut down. Many lab classes had to be cancelled while others struggled to find a way to transfer to an online approach. In some cases such as in Physics, we were able to increase enrollment since in an online format we are not limited by physical lab space. Please read in the Notable Achievement section how departments such as Biological Sciences found a way to create hundreds of take home kits in order to serve students that were left behind in the Spring. Efforts on behalf of both faculty and staff deserve high recognition in this space. The Division is grateful for the amazing new EM tool provided by Daniel Berumen and Joumana McGowan and look forward to using it in the future.

Division Goal 6-Cutting Edge: Develop, support, and implement innovative programs for students utilizing cutting edge equipment and technology.

The use of cutting edge equipment and technology has never been more important. With the help of CARES Act funding, the division has been able to offer technological support for the transition to remote instruction. Some examples include tablets for Chemistry professors, e pens for STEM coaches, and mass quantities of take home materials for students including nearly 1500 microscopes.

Division Goal 7-Undergraduate Research: Support undergraduate research across the Division by providing on campus opportunities as well as collaborative experiences with four year colleges and universities.

This remains an ongoing goal. Through the STEM Center, students were able to participate in the Undergraduate Research Initiative. Grants totaling over \$2.5 million have been secured by faculty in the Physics and Engineering Department as well as the Chemistry Department.

Division Goal 8- 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 MakerSpace, has been paused due to COVID-19. Unlike other academic support centers, MakerSpace cannot transition to remote service. Faculty and staff continue to maintain equipment in the hopes to one day welcome back students and the community.

External and Internal Conditions Analysis: In the midst of a pandemic the likes the world hasn't seen for 100 years, it's hard to recall conditions, external or internal that do not stem from COVID-19. As a result, Mt. SAC has been forced to offer remote instruction for nearly all of its courses. Overall, faculty who never thought they would be teaching online are now zooming in their living rooms in order to serve students. Coaches and tutors are connecting with students remotely in order to provide extra assistance.

Many labs are not well suited to online teaching. As there is no clear date when labs will resume in person, it is crucial to maintain the support provided by the college in the form of the two anatomy software products, Respondus software, take home kits with microscopes for Bio 1 and Micro 22, take home kits with pipets for Bio 8, and state license for Labster. In Earth Sciences, Astronomy, Physics and Engineering, support for material needed for take home kits is essential to maintain levels of quality in instruction. A huge external influence is the Los Angeles County Department of Public Health. Through their guidance a few courses were able to be offered in person including Histotechnology from the Natural Sciences Division.

While many programs are making do, the overall quality of instruction still has much room to grow. In some areas, such as AG, the RVT program has been hit hard. Courses like Surgical Nursing are essential and must be provided hands on. As the Return to Campus Committee continues its difficult work, prioritization of essential courses as well as their impact on subsequent programs such as Nursing and RVT is extremely important.

Program Planning (Equity, Retention and Success): RETENTION (Data taken from Power BI 8/22/2020)

Summer 2018 (Mt. SAC-89.5%); Summer 2018 (NSD-86.7%)

Summer 2019 (Mt. SAC-89.8%); Summer 2019 (NSD-86.0%)

Fall 2018 (Mt. SAC-86.7%); Fall 2018 (NSD-83.6%)

Fall 2019 (Mt. SAC-86.9%); Fall 2019 (NSD-82.2%)

Winter 2018 (Mt. SAC-91.3%); Winter 2018 (NSD-89.8%)

Winter 2019 (Mt. SAC-90.0%); Winter 2019 (NSD-89.1%)

Spring 2018 (Mt. SAC-86.2%); Spring 2018 (NSD-82.8%)

Spring 2019 (Mt. SAC-86.9%); Spring 2019 (NSD-83.3%)

Analysis: There is quite a bit of consistency when it comes to retention. The NSD is consistently approximately 2-3% below the College average. There was a slight dip of 1.4% in Fall and .7% in Summer, and a slight increase in Spring of .5%.

SUCCESS (Data taken from Power BI 8/22/2020)

Summer 2018 (Mt. SAC-79.2%); Summer 2018 (NSD-68.9%)

Summer 2019 (Mt. SAC-80.6%); Summer 2019 (NSD-70.9%)

Fall 2018 (Mt. SAC-68.6%); Fall 2018 (NSD-59.4%)

Fall 2019 (Mt. SAC-69.5%); Fall 2019 (NSD-58.7%)

Winter 2018 (Mt. SAC-80.7%); Winter 2018 (NSD-72.4%)

Winter 2019 (Mt. SAC-81.3%); Winter 2019 (NSD-72.9%)

Spring 2018 (Mt. SAC-70.4%); Spring 2018 (NSD-61.5%)

Spring 2019 (Mt. SAC-71.2%); Spring 2019 (NSD-62.2%)

Analysis: In terms of success rates, the NSD consistently falls approximately 8-9% below the College average. However, worth noting is that with the exception of Fall where there was a .7% decrease, the NSD has increased success rates over the past year, particularly in Summer, where there was a 2% increase.

EQUITY

The inclusion of Equity as a planning metric is critical now more than ever. As this is the newest addition to PIE Planning for Mt. SAC, not a lot of discussion has taken place on best practices for measurement. The goal for the future is to infuse equity as a lens for measuring success. Perhaps the addition of the data coaches for each division is a step toward this goal. Anecdotally, here are a few examples of how the NSD is working toward a more universal equitable approach to our work.

- Hiring committees have received EEO training and have worked closely with the Academic Senate to create committees whose membership is as diverse as possible
- 10 faculty members and 1 dean registered to attend the Skyline Equity Institute for STEM. The institute was cancelled due to COVID-19 but members are planning to attend the virtual reboot.
- Faculty, staff, and managers have registered and completed the CORA Certificates address either implicit bias or microaggressions.
- New faculty members have been creating equity and universally designed syllabi
- Many conferences, workshops, and webinars have been attended.

Analysis of Division's Plans, Activities, Resources and Critical Decisions: As indicated throughout this document, the biggest critical decisions made by any division centered around how best to deal with the transition to temporary remote instruction. In the sciences, a key component to making these transitions work was the ability to offer labs online along with take home kits for nearly 1500 students. There is no way this enormous task could have been accomplished without countless hours of planning on the part of faculty, staff, and managers. Additionally the collaboration with Facilities, Fiscal, and Risk Management was remarkable. Finally, there is no way the necessary materials could have been provided without CARES Act funding. Below are a few highlights of critical decisions made by departments and included in their unit PIEs.

Agricultural Sciences

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.

Biological Sciences

We have decided to offer most of our labs in online format. For Anatomy the software we obtained was crucial to help us do this effectively. For Bio 1, Bio 8 and Micro 22 the take home kits were crucial to allow us to do this. We decided not to offer some classes in the Fall, including Anat 40A, Anth 4, Bio 2, Bio 6L, Bio 21, Bio 34L, and Micro 1.

Mathematics and Computer Science

Due to the COVID-19 pandemic, the campus was closed starting March 17, 2020. Math faculty subsequently attended online training (such as FCLT workshops, state-level webinars, YouTube videos, and peer-led workshops), learned new technology (such as Canvas, Zoom, MyLab, ALEKS, WebAssign, ConnectMath, YouTube, and screen-recording software), restructured their classes, revised their syllabi and timelines, and developed their Canvas shells. The initial preparation to go online was accomplished within a short two-week window of time. Notably, 100% of math classes were moved to TRI. The MARCS also successfully transitioned to online tutoring.

After the successful transition to online instruction, math and computer science faculty continued their department and campus-wide involvement online via Zoom. Curriculum committees continue to meet during this time. The Co-requisite Committee is investigating effective support options for teaching online courses. In addition, the department is still involved in staff development, as evidenced by the weekly Community of Practice sessions which provide a platform for sharing promising practices for teaching online math classes.

Physics and Engineering

- Made videos of labs/increased use of simulations/assemble kits for courses
- Achieved noncredit teaching lab status for the MakerSpace
- Uses a lot of student workers to attempt to fill in for some of the duties that would be carried out by a second Lab Technician
- Developed Take-Home Labs

-Recruited new adjuncts

Where do we go from here?

In the near future, management, staff, and faculty need to work together to continue to fine tune all of our online service to students. Further, at home lab materials need to be evaluated for effectiveness and safety. Ongoing support is needed to support these efforts until a widely distributed vaccine is available and herd immunity is achieved.

Prior to March 2020, the Natural Sciences Division did an enormous amount of planning, meeting, and collaborative work on our new Science Building that is a part of the Facilities and Educational Master Plan. Though we are currently serving students from the comfort (or in many cases, the discomfort of our homes) the plan is to once again move forward on the building so that the future not only look bright, but shiny and new for our students.