SAN DIEGO MESA COLLEGE

Program Review

Summary and Reflections with Unit Goals, Action Plans, and Updates

Instructional Program - Chemistry (CHEM)

Executive Summary

Describe the successes and challenges your unit has faced since the last comprehensive review.
Chemistry is considered to be the central science because physics, engineering, biology, and allied health majors, and many other majors require courses in chemistry. Because of this, the Chemistry Department offers many courses ranging from preparatory chemistry, general chemistry, organic chemistry, analytical chemistry, allied health prerequisites, and a general education course with an emphasis in environmental issues.

Currently, there are 10 full time faculty members and 18 adjuncts in the department. Adjunct FTEF is 9.0 for Fall 2023 which is 46% of our total FTEF. There are four Instructional Laboratory Technicians. Our fill rate for Fall 2023 is 96%, with a productivity (FTES/FTEF) of 14.5. The department is hiring a full time tenure track professor for Analytical Chemistry to start in Spring 2024.

The Chemistry Department creates a supportive learning environment that spans across our curriculum. We constantly assess our student success across courses that form a sequence (e.g. Majors Preparation Track 152->200->201 or Allied Health Track 100->130->160). Our department works hard to establish a set core of standards so that students can succeed as they move through our courses. Laboratory courses provide an equitable way to present hands-on learning that supports lecture material. Laboratory work also provides a venue for students to work collaboratively and make STEM relationships that can support them through their courses. The Chemistry department prides itself on having student centered teaching and providing high quality equitable instruction grounded in standards for scientific work that will allow students to be successful at four year schools. The hallmark skills that our department fosters are critical thinking and hands-on experiential learning . Our professors use lecture presentations, small group discussions, worksheets, application to the real world, and hands-on laboratory training to help students understand and learn what is considered to be a very difficult and intimidating subject. Critical also is our interaction with students via office hours, review sessions, support courses such as Chem 16 and Chem 20, and Canvas.
The Chemistry Department is committed to preparing students for transfer to four year schools and providing a foundation in future work in science or professional schools. The Chemistry Department is committed to preparing students for transfer to four year schools and provide a foundation in future work in science or professional schools. There were 6 Associate Degrees in Chemistry and 8 degrees in Liberal Arts and Sciences Science Studies-Chemistry conferred during Fall 2023. 21% were Asian American and 29% were Latinx.

Our departmental goal is to create spaces to greet students in the most positive way and to help them reach their potential as STEM students. San Diego is a STEM hub and has two of the most highly ranked schools for STEM in the State: UCSD and SDSU as our transfer institution. We take pride in preparing students for transfer and honing in on their analytical and critical thinking abilities. This is a process for students as they make their way through our courses to achieve their dreams of becoming scientists, engineering, pharmacists, doctors, nurses, physical therapists, and environmental scientists. Chemistry does not have many students majoring in chemistry (see previous paragraph). However, we are a highly enrolled program due to our role in supporting Biology (both Biology Majors and Allied Health Majors) and Engineering Majors. Our Department has worked together as a team and is proud of the work they have achieved to reduce barriers to student success. We have pivoted in so many ways and always worked as a team to provide quality learning for our students. These transitions required constant re-writing and adjusting of course materials and countless hours of work from our faculty. Many transitions occurred over the last three years including face-to-face, to online even in lab, to returning during the pandemic for limited labs, to full return Fall 2021, and then pivoting to first three week remote and then back to campus Spring 2022. Fall 2022-Spring 2023 feels a lot more “normal” and natural. The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment.

The philosophy of the department is to be student centered and equitable while upholding standards of excellence in scientific and critical thinking. Standards are important to our department while providing an engaging, supportive, and positive learning environment. This is achieved by communicating clear expectations to students, student centered pedagogy, equitable teaching practices, open door attitude to students, updating and improving laboratory courses, support courses, participation in embedded tutoring programs and Peer Mentoring, close relationship to counseling, and a focus on equity. Participation in and leading Professional Development training and opportunities in the college is also an important practice in the Chemistry

Department. Many faculty within the department are actively involved in leadership positions on campus to participate in shared governance.

If applicable, describe any major curricular or service changes your unit has engaged in and the impact of those changes since the last comprehensive review.

Please see Discussion of Accelerated Chemistry 200 in the Course Data Section.

If applicable, describe the impact of any new resources (human, fiscal, etc) on the unit and/or action plan implementation.

Need for New Faculty

The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment. To this end, the Department has taken leadership roles and participated in many events and programs to help students feel welcomed and supported. We have pivoted in so many ways and always worked as a team to provide quality learning for our students. These transitions required constant re-writing and adjusting of course materials and countless hours of work from our faculty. The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment. It is our belief that our department needs one additional full time faculty member to join our team of educators. We need an equity minded General Chemistry instructor with a strong analytical and thermodynamics background that leans towards physics/engineering. This is for reasons that will be explained in this narrative. In addition, we would like a faculty member that has an interest in forming partnerships with outside institutions and bringing research collaborations with four year colleges and universities.

The Chairs and Senior faculty of the Chemistry Department are excellent new faculty mentors. We assign each new faculty a mentor who works with them throughout their tenure process. Additionally, the department works to maintain a supportive, nurturing space for all department faculty. This has led to two of our tenure track faculty recently being tenured, and our most recent faculty hire being quickly integrated into the department activities and comradery. This requires regular meetings, as well as constant office/hallway discussion of everything from activity organization, to teaching techniques, to course content and pacing. It is a constant and regular part of our days for new, as well as senior faculty. It is what makes our department run so well and how we can easily integrate a new contract faculty members into the mix.

We are requesting one more full time faculty member and our data shows that we are able to justify this request. One of our full time faculty members will be retiring by Dec. 2023 and at least one more by Spring 2024. Mr. Fremland will be officially retired as of December 2023. He is an integral part of our General Chemistry sequence in particular Chemistry 152. As this program review discussed above, General Chemistry track, in particular, Chem 152 is most impacted by AB 705, and the other educational policies. Chemistry 152 and Chem 200 are considered the gateway courses to STEM because they are required for other majors such as Biology and Engineering. Our department has worked tirelessly to help students through the supportive student-facing interventions described in the excellence section below. This includes participation in Path to Stem Success, HSI E-3 Grant projects, STEM Success Days, and Peer Mentoring/Faculty Workshops. We need one full time faculty member that will focus exclusively on General Chemistry.

There are two major projects that justify the additional full time contract faculty.

One is the Chemistry 200 Acceleration that will eliminate barriers to General Chemistry and supports timely completion of educational goals. This project focuses on improving instructional effectiveness with a gateway STEM course. This is a data driven project that shows success in general chemistry if the student has completed pre-calculus (Math 121+). This change will require curriculum changes, discussion at District level, and support course curriculum. It has the potential to save many students 3.5 units. There is a contract faculty member leading these efforts who is also department chair, but this is a many year long process that needs a dedicated full time general chemistry professor. It is a goal for the department to analyze the data from this project next Program Review Cycle.

The second is adjusting curriculum to adjust for AB 705. Chemistry requires specific math skills upon entering our General Chemistry or Allied Health pathways. Because of changes in math prerequisites, our department will have to adjust curriculum and work tightly with the math department to continue to provide quality chemistry education. This will require additional full time faculty members in our department. Department Chairs are working with Math Chairs and Dean to understand more fully what the legislation is requiring and the impact it will have on STEM majors. This conversation is occurring through chemistry

departments' heavy involvement in the HSI Curriculum Work Group through the E-3 HSI Grant.

If you assess OUTCOMES, please confirm that the outcomes have been reviewed for accuracy. If you do not assess Outcomes, skip this question.
Reviewed & Accurate

Related Documents for Charts and Graphs
Chemistry Program Review Fall 2023.pdf

Executive Summary Complete
Yes

Data Reflection

Trends observed in program/service area's data.
Analysis of Enrollment Trends

The Data dashboards used for this data is Mesa College Course Outcomes Dashboards

The enrollments have changed over time (Table 1). Since last Program Review focused on pandemic teaching and trend, the goal of this Program Review will be to discuss changes to enrollment and success rates pre-pandemic face to face average of Sp '18, Fall '18, Sp '19, and Fall '19 compared to face to face Fall '21 and Spring '22. Fall 2022 and Spring 2023 are included with enrollments. This report will exclude semesters that were discussed in last year's Program Review.

PLEASE NOTE THAT THE COMPLETE DOCUMENT WITH GRAPHS WAS UPLOADED AS A pdf.

**TABLE 1-ENROLLMENT BY SEMESTER

Enrollment had dropped post pandemic which was consistent with local, State, and National trends in community college enrollment. For example, there was approximately a 30% enrollment drop from Fall '18 to Fall '21. (Table 1). However, now the trend is reversing and our enrollments are rising. This Fall 2023 has 2253 enrollments across 76 sections compared to Fall 2022 with 1979 enrollments, a 14% increase. All 76 of those sections are held completely on campus. We saw a significant drop in enrollment in F21/S22 when we brought the majority of our classes back to campus. We have seen a consistent increase since then, although we are still below Fall 2019 by 16%. Our department prides itself on excellence in managing enrollment. Our fill rates exceeded 93+% over the last year. This Fall 2023, our department is at a 96% fill rate.

The trends in Success Rates Disaggregated by Ethnicity in Chemistry are listed in Table 2. Note that the percentage of students enrolled in our course

**Table 2 attached below.

Overall trends for Fall 2022-Spring 2023

-Overall chemistry success rates match or exceed college success rate. Fall '22 was a 76% success compared to the 75% success rate of the college. Spring 23 was a 78% success rate compared to a 75% college success rate. This overall success rate is similar to pre-pandemic success rates.
-White and Asian students exceed the overall chemistry success rates in all the semesters shown in Table 2. The percentage of White (~25%) and Asian (11%) students is fairly consistent among all the semesters.
-Latinx students represent a consistent percentage (~37%) of our students. This is lower, but similar to the campus representation of Latinx students (~40%).
-Latinx student success rates tend to be fairly consistent between semesters, but lower than the average overall success rates. There is an equity gap. This gap and interventions will be discussed further in the next section.
-Black/African American students represent a very small percentage of our total student demographic. The percentage (~3% average) is lower than the campus representation (6%). This underrepresentation of Black/African American students will be

discussed further in the next section. Black/African American student success rates in chemistry tend to fluctuate. The small number of ----Black/African American students in our classes makes it difficult to discuss trends. Fluctuations in drops will significantly affect the overall success rates.
-Spring 2023 saw the highest success rate for Black/African American students in the last 8 semesters analyzed.

Describe any equity gaps in the data. Are there differences and/or patterns observed by demographics (e.g.race/ethnicity, gender, age, etc.)
Student Success Rates at Course Level

Mesa College Data Dashboard for the department overall shows a similar success rate to the overall campus success rates taking into account data from face to face semesters F21-Sp 22 (73%). This includes the courses Chem 100, 103, 130, 160 (Allied Health and Nutrition track), General Chemistry (152, 200, 201 track), and Organic Chemistry (231, 233). An equity gap exists with Latinx students having an overall success rate of 66%.

Equity gaps are most prevalent in two of the three General Chemistry classes (Chem 152, 200) and Organic Chemistry (Chem 231). The General Chemistry courses consistently reflect the percentage of Latinx students at the college which is ~37%, the data that will be discussed is a comparison of Latinx and white student success rates. Please note that Asian success rates match or slightly exceed white student success rates (Table 2).

At the course level, discussions of Black/African American success rates become difficult due to the small numbers of students. In most classes after Chemistry 200, the numbers do not allow for the statistics to be recorded on the dashboards. Small changes in enrollments lead to large changes to success rates due to small numbers of students.

Note: This discussion will focus on Comparing Fall 21 and Spring 22 to previous on campus semesters (Sp 18, F 18, Sp 19, and F19).

Success Rates in General Chemistry

General Chemistry is defined as the pathway of courses of Chemistry 152?200? 201 that is part of the curriculum for most science majors: Biology, Chemistry, and Engineering (some programs only require Chem 200).

Chemistry 152: Preparation for General Chemistry

Graph 1 shows an equity gap for Latinx students of -7% for Fall ‘22 and an equity gap of -9 for Sp ‘23 that is consistent with pre-pandemic equity gaps.
Despite our best efforts, educational trends and legislation are making strides for lowering equity difficult. As science educators, we would be remiss to not discuss the impacts of AB 705 from the perspective of science education. AB 705 removed Intermediate Algebra from our course offerings at community colleges. Mesa College phased out Math 96 and there are currently no sections being offered. Support Course Models “x” classes to refresh material is the model being implemented. Returning students (adult learners, veterans, single mothers) that may have for a multitude of reasons chosen to take Math 96 are not allowed the choice to take an algebra course.

The effect of AB 705 implementation has not been properly vetted State wide in terms of the effects on science success rates. Physics and chemistry are required courses for Biology and Engineering Majors (top majors) and these subjects rely on strong algebraic abilities. There is a fluency in mathematics knowledge required for science courses. Data shows that students' ability to successfully complete chemistry and physics courses is linked to their math levels. The important connection between math knowledge and science courses' success rates was not taken into account with the legislation.

The prerequisite for Chemistry 152 is Math 96 or M50. However, due to AB 705, most students are clearing the M50 level and can register for Chem 152 without actually being prepared with the algebra skills needed for the course. From data provided by IE, many students are taking Math 116, 104, or 119 concurrently with Chemistry 152. However, students may not have the algebra skills. Students can clear M50 with three years of high school math (IM 1, 2, and 3). It also means that a student can potentially take Chemistry 152 without having had math in high school senior year. Many students enrolling at Mesa are not coming directly from high school. So, recency of math is undoubtedly an issue. Many may clear M50 without having any recent recollection of algebra.

Summary and Reflection

Chemistry 200 General Chemistry I
Graph 2 shows success rate data disaggregated for Latinx and White students for Chemistry 200 shows a solid success rate for general chemistry- 78% (Sp ‘23) and 71% (F ‘22).
The equity gaps between Latinx students and White students varies from each semester. However, Fall ‘22 and Sp ‘23 show wider gaps of -15 & -19.
However, there is a positive trend. As discussed in the last program review, Latinx students' success rates were most affected by the pandemic with a low point in Sp ‘22. Latinx students' success rates have improved since then and match pre-pandemic success rates. There is still a significant equity gap when compared to white students.

Accelerated Chemistry 200

As one important part of our contribution to the HSI Equity, Excellence, and Exito, Dr. Budzynski developed a course aimed to accelerate students and lower unit requirements thereby saving students time and money. Chem 200 is General Chemistry I Lecture (3 units) ?with a Chem 200L coreq (2 unit lab). ?Chem 152/L prereq (3 + 1 = 4 units) or pass Challenge Exam is the prerequisite. Chem 200 is required for many STEM majors: Chem, Biol, Phys, Enge, and Kinesiology.

In Accelerated Chem 200?, students who have passed Math 121 or higher can skip Chem 152/L?. Chem 20 is the support class coreq (0.5 units) and Chem 200L coreq?uisite. This saves them 3.5 units?.
In Fall 22 + Spring 23, the department offered one section each semester; mixed class with non-Acc students. There were a total of 36 Acc Chem 200 students. Approximately half were Enge majors and a quarter Biology majors.? The success rate 75% (Average overall Chem 200 success rate is 70%)?. Acc Chem 200 Demographics: 31% Asian, 19% Latinx, 39% White? while overall Chem 200 is 15% Asian, 36% Latinx, 31% White?. ?

More data analysis will follow this year as more data will be collected by having more students complete the course and expanding course offerings in Spring ‘24. This will require one more full time faculty member (see need for new hire section).

Chemistry 201

The data from Chemistry 201 is shown in Graph 3. In Fall ‘21 there were no equity gaps between White and Latinx students which is great news. In Spring ‘22, the equity gap was 4% but Latinx students’ success rate was the same as the overall average. The data also shows that F ‘21 and Sp ‘22 had higher overall success rates than F ‘19. The overall success is slightly lower than Sp ‘18, F ‘18, and Sp ‘19, but the equity gaps are significantly better.

Fall ‘22 shows what is hopefully an anomalous semester. The overall success rate matched the college success rate 72%. But the Latinx students only had a 55% success rate compared to 77% for the white students. Spring ‘23 showed a high success rate of 85% with white students having a success rate of 97% compared to Latinx students at 77%.
There is not an explanation to this data and more analysis will come next program review.

Organic Chemistry-Chemistry 231
Organic Chemistry is a course that is taken by most biology and all chemistry majors. Our program is smaller than General Chemistry. Graph 4 shows an increase in success rates for overall success rates, success rates for white and Latinx students in Chem 231 in Spring ‘23. In Fall ‘22, there was no data for Latinx students meaning that the number was lower than 10 students. The organic chemistry program appears to be strengthening and this is in part due to expanding our team to two devoted Organic Chemistry professors (Saidane & Chang). Our new tenure track professor, Dr. Chang, has certainly been an excellent addition to our program.

Chemistry 233

The success rate for Chem 233 for Fall 2022 is 65% and for Spring ‘23 was 90% compared to 77% in average of Sp 18, F 18, Sp 19, & F19. There is clearly not an overarching trend. There are not enough enrollments ~20 each semester to disaggregate the data.
Success Rates in Allied Health Track

Summary and Reflection

The following Table 7 shows a comparison of the Allied Health Courses:

All of the courses in our Allied Health Track exceed the overall college success rates in Fall ‘22 and Spring ‘23.

Chemistry 100 has an equity gap. Latinx students have a 65% success rate in Chemistry 100 in Spring ‘23 vs. 85% success rates for white students. Latinx students have a 81% success rate in Chemistry 100 in Fall ‘22 vs. 90% success rates for white students. Disaggregation of the remainder of the courses is not available due to lack of number of students.
General Education Course-Chem 111

This course has a high success rate of Fall 2022 (75%) and Spring ‘23 (79%) which is slightly lower than the average success rate of 83% in Sp 18,F18,Sp 19, F19. This course is a great course to promote sustainability. Please see the Sustainability section of this document.

Laboratory Courses
Chemistry courses have co-requisites that provide hands-on and active learning to supplement the lecture. Chemistry lab provides a way of visualizing abstract concepts in a physical way.
In addition, students are encouraged to discuss their data as a class. In appropriate cases, they work in small groups. Laboratory is a way is a fantastic way to foster camaraderie among students and professors. Our success rates in all laboratory courses exceed college success rates (Table 8).

Related Documents for Charts and Graphs
TABLE 1.docx;
TABLE 2.docx;
GRAPH 1.docx;
GRAPH 2.docx;
GRAPH 3.docx;
GRAPH 4.docx;
GRAPH 5.docx;
GRAPH 6.docx;
GRAPH 7.docx;
TABLE 7.docx;
TABLE 8.docx

Describe the discussion(s) that took place about the unit's learning outcomes assessment data.
Course Outcomes Assessment Data:

This was discussed at CLO Department Meetings and Department Meetings in Spring 2022, Fall 2021, and Spring 2023.
Planning for next year has started.
Most likely we will continue similar evaluations for our courses and programs as was done in previous years. This includes:

-Measurements and Chemical Calculations
-Atoms and Compounds
-Structure and Properties
-Chemical Reactions
-Nomenclature

Program Outcomes focus on the following areas:
Note: Program is defined as General Chemistry (152-200-201)

Critical Thinking
Communication
Personal Responsibility

Summary and Reflection

? For the lecture courses:
? Questions were given to students as part of an exam.
? Results were collected and evaluated to see if the benchmark was met.
? For the lab courses
? Grade the materials, safety, and procedures of one experiment for each course.
? Results were collected, evaluated to see if the benchmark was met.

For the lecture courses: 70% of correct answers
For the lab courses: 70% of correct answers

For the lecture courses Benchmark met.
Chem 152 (71.4%) , Chem 200 (74.1%), Chem 201 (80%)

For the lab courses Benchmark met.
Chem 152L (85%) , Chem 200L (86%), Chem 201L (84%)

Target met and exceeded for all the courses.

Data Reflection Complete
Yes

Practice Reflection

Describe current practices your program/service area has engaged in that you believe impact the above data trends and equity gaps.
Program Involvement & Best Practices

This academic year of Fall 2022-Spring 2023 and in light of the "post" pandemic learning and teaching obstacles, the Department has put all its efforts to provide as much support as possible to students in numerous ways. Our department is extremely active in participatory governance, campus wide committees, and the HSI Equity, Excellence, and Exito (E-3) Grant. We support high quality and culturally relevant curriculum as part of every day teaching. Many of our contract faculty members support Honors Contracts that allow students to make relevant connections to important research.

The Curriculum Work Group HSI E-3 Grant has five Chemistry full time faculty who have taken initiative in participating in the HSI Excellence, Equity, and Exito since Fall 2021. This is interdisciplinary work focusing on the elimination of barriers and to provide support for students entering Mesa College. We are collaborating heavily with the faculty from physics, math, engineering, and biology. This has led to many projects that will require a faculty lead to institutionalize a significant overhaul of General Chemistry.

The work group is discussing how AB 1705 will affect science courses. AB 1705 seeks to further remove choices for students to select the appropriate math journeys. Currently, Mesa course offerings offer students a wide variety of entrance points into mathematics and include both non-support and support options: Math 116/Math 116x (College Algebra and Matrix), Math 104/104x Trigonometry, and Math 141/141x Precalculus. Students have choices in their math journey. AB 1705 legislation seeks to validate the need for any course including transfer level courses such as Precalculus (Math 141) by Fall 2025. Mesa STEM faculty are extremely concerned that the validation process at the state level is not transparent and many questions remain on validation studies. The validation process currently used on validating precalculus for business majors would be flawed if the same approach is used for validating precalculus for STEM majors. In addition, if validation is not shown, the most strict interpretation places ALL students in calculus. We support students with four years of math being able to register into Calculus without any barriers. We strongly oppose forcing ALL entering community college students into Calculus.

Students with two or three years of high school math should have the choice to take a one semester Precalculus course. Returning students, in particular Veterans that are adult students, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to teach Pre-Calculus. The double standard of not allowing community college students to take a precalculus is inequitable.

Summary and Reflection

In addition, the use of support course models for Calculus fails to meet common sense and learning theory pedagogy. Teaching Calculus with a support course involves 6-8 hours a week of Calculus lecture + support (lab). Algebra, trigonometry, and precalculus are introduced while teaching Calculus. This places an undue burden on students and faculty. In addition, for students with less math preparation, students are not reviewing or refreshing information.

Important questions from Mesa Chemistry remain. Since most students begin their path with Chem 152 and Math.
How will working students be able to register for other courses if the time and unit demand is so high for Calculus?
Will Latino students be most impacted by the legislation?
How will this affect our enrollment of Latino students in our pathways?

*STEM Success Days Lead: Ms. Moore Interdisciplinary celebration of students. Two day event that brought in games, food, four year colleges, and "Wall of Fame". UCSD and SDSU representatives attend.

*Peer Mentoring Lead: Dr. Chang Fall '19-present Chemistry has been actively involved in the Peer Mentoring Program. We have had two Peer Mentors over the last year. We continue to encourage students in General Chemistry to attend.

*Participation in Classroom Tutoring Program: Chemistry 100 instructors (Ms. Moore, Mr. Fremland, & Dr. Gustin) participated in mentoring classroom tutors. This is a great way of providing more support for students.

*Path to STEM Success: Dr. Fusco Hernandez In Summer 2022, this was a four day event welcoming students to STEM at Mesa College. In Intercession 2023, this was a two event with 40 participants. It has received much positive feedback and campus accolades. This program continues to grow under her leadership.

*Enrollment Management-Campus Involvement
Chemistry has taken an active role in participating in campus efforts to write an Enrollment Management Plan. Our department sees equity in the details especially in providing a reliable and managed schedule with minimal cancellations. Dr. Budzynski is the lead faculty member in this campus wide effort. Other chemistry faculty are the co-leads in the subgroups and these include. Dr. Paula Gustin as a faculty co-lead in the Innovation and Partnership Work Group. Ms. Danica Moore is the faculty co-lead in the Communication and Marketing. Dr. Chang, Dr. Hernandez, and Dr. Sardo also participated in the subgroups.

*Participation in Campus Wide Registration Days.
This work was done by Dr. Budzynski, Dr. Fusco Hernandez, Dr. Gustin, and Ms. Moore. Chemistry participated and coordinated with counseling in Registration Workshops (two different ones) and Financial Aid Workshop. These are great ways to informally help students and work with counselors (P. Rodriguez and G. Adona) and other STEM departments to answer questions regarding courses.

*Faculty Led Workshops Lead: Dr. Sardo/Dr. Gustin Fall 2022: These workshops were funded in response to student success data and observations from 2021-2022. Students were struggling in post pandemic courses. Total 27 sessions, 196 total visits = 7.3 students on average per session.

* Study Jams Lead: Dr. Fusco Hernandez Fall 2022 Interdisciplinary study time with faculty where students can attend before midterms and finals.

*Caffeine with Chemistry Lead: Ms Moore Fall 2022 This has been in response to the college feeling lifeless due to college being online. Caffeine with Chem was a way of creating a positive space where students can have coffee with professors. This has been very successful.

*ACS Chem Club Lead: Dr. Chang Fall 2022 Dr. Chang resurrected the American Chemistry Society Chemistry Club. It had 40+ members! This was a great way of providing students with an in person collaboration and a place of belonging in STEM. Collaborations are campus wide with such areas as Fashion.

*Lab Redesign: Many laboratory manuals have been updated or redesigned in Chem 100L, 152L, 231L, 233L and 103. Thanks to Dr. Fusco Hernandez, Ms. Moore, Dr. Saidane, and Dr. Sardo

Summary and Reflection

*Sustainability

Our students show a strong interest in environmental issues and sustainability and our department has an environmentally focused curriculum in many courses. Our Chemistry 111/111L which discusses climate change, water and air pollution, and the disproportionate impact on communities of color. Many of our laboratory courses-Chem 200L and 201L- which serve our STEM majors of engineering and biology have laboratory analysis that is related to the environment. This is particularly focused on water pollution. There has also been an active effort on the part of our six Lab Coordinators to participate in Green Chemistry Lab Redesign to reduce chemical usage, and substitute more environmentally friendly chemicals into experiments where possible. New faculty can develop a new curriculum for Chem 200/20 that expands on environmental themes, as well as help in this development for other courses, workshops, and even work with our departments. The Allied Health track courses (Chem 100, 130, 103, 160) also have a curriculum module which discusses climate issues with respect to healthcare issues and racial inequities. Chemistry faculty (Mr. Fremland, Dr. Paula Gustin) have been involved with the campus efforts led by the Environmental Sustainability Committee by participating in their Climate Literacy Survey. This semester (Dr. Budzynski and Dr. Paula Gustin) have agreed to join the faculty workshops in the hopes of obtaining a LEAF designation on the course outline of record for Chem 111/111L. In addition, we have worked with the English Department faculty (Ranmali Rodrigo and Robert Pickford) and Chairs (Jill Moreno Ikari and Chris Sullivan) to form an interdisciplinary work group that we affectionately call STEMGLISH. This group worked collaboratively to not only have climate and healthcare focused topics for the English 101 class, but also to schedule one section in the STEM building and to actively encourage chemistry student enrollment in these English courses. It is part of our department's commitment to educating students regarding climate action and responsible stewardship.

What other factors (internal or external) might also impact the above data trends and equity gaps?

This was addressed earlier in document:

The main consensus was that the source of this anomaly was that this semester started remotely for three weeks due to the Omicron wave. Faculty discussed how this completely changed the dynamics of the class as the first three weeks tend to focus on unit conversions which are foundations to the rest of the course. This remote period is most likely the cause of this unusually low success rate data.

There is also the major effect of AB 705. The prerequisite for Chemistry 152 is Math 96 or M50. However, due to AB 705, most students are clearing the M50 level and can register for Chem 152 without being prepared with the algebra skills needed for the course. From data provided by IE, many students are taking Math 116, 104, or 119 concurrently with Chemistry 152. However, students may not have the algebra skills. Students can clear M50 with three years of high school math (IM 1, 2, and 3). It also means that a student can potentially take Chemistry 152 without having had math in high school senior year. Many students enrolling at Mesa are not coming directly from high school. So, recency of math is undoubtedly an issue. Many may clear M50 without having any recent recollection of algebra.

In addition, students in Fall 2021 and Spring 2022 would have been in online coursework in high school. There have been many articles published regarding the negative impact online learning had on skills in math. https://www.nasbe.org/the-impact-of-covid-19-on-math-achievement/

These are believed to be the factors in our Fall '21 and Sp '22 academic year.

Related Documents for Charts and Graphs

Practice Reflection Complete

Yes

Mid-Cycle Updates

YEAR 2 Updates (2023 - 2024)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 2.

Currently, there are 10 full time faculty members and 18 adjuncts in the department. Adjunct FTEF is 10.8 for Fall 2024 which is 54% of our total FTEF. There are four Instructional Laboratory Technicians. Our fill rate for Fall 2024 is 101%, with a productivity (FTES/FTEF) of 15.26. The department is hiring a full-time tenure track professor for Analytical Chemistry to start in Spring 2024. We are requesting one full time faculty member for General Chemistry track. See justification in resource page.

Summary and Reflection

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 2.
There were some updates with success rate trends for Fall '22 and Spring '23.

PLEASE NOTE THAT THE COMPLETE DOCUMENT WAS UPLOADED AS A pdf in nuventive titled "Chemistry Program Review Fall 2023". This is the documents folder. Please see pdf for graphs.

It can also be viewed at the following link:
https://docs.google.com/document/d/1h97Ml3IFiWzW1WDSMAiHUIsIcpPzTD6z4evO-KRX94Q/edit

Mesa College Data Dashboard for the department overall shows a similar success rate to the overall campus success rates taking into account data from face to face semesters F21-Sp 22 (73%). This includes the courses Chem 100, 103, 130, 160 (Allied Health and Nutrition track), General Chemistry (152, 200, 201 track), and Organic Chemistry (231, 233). An equity gap exists with Latinx students having an overall success rate of 66%.

Equity gaps are most prevalent in two of the three General Chemistry classes (Chem 152, 200) and Organic Chemistry (Chem 231). The General Chemistry courses consistently reflect the percentage of Latinx students at the college which is ~37%, the data that will be discussed is a comparison of Latinx and white student success rates. Please note that Asian success rates match or slightly exceed white student success rates (Table 2).

At the course level, discussions of Black/African American success rates become difficult due to the small numbers of students. In most classes after Chemistry 200, the numbers do not allow for the statistics to be recorded on the dashboards. Small changes in enrollments lead to large changes to success rates due to small numbers of students.

Note: This discussion will focus on Comparing Fall 21 and Spring 22 to previous on campus semesters (Sp 18, F 18, Sp 19, and F19).

Success Rates in General Chemistry

General Chemistry is defined as the pathway of courses of Chemistry 152?200? 201 that is part of the curriculum for most science majors: Biology, Chemistry, and Engineering (some programs only require Chem 200).

Chemistry 152: Preparation for General Chemistry

Graph 1 shows an equity gap for Latinx students of -7% for Fall ‘22 and an equity gap of -9 for Sp ‘23 that is consistent with pre-pandemic equity gaps.
Despite our best efforts, educational trends and legislation are making strides for lowering equity difficult. As science educators, we would be remiss to not discuss the impacts of AB 705 from the perspective of science education. AB 705 removed Intermediate Algebra from our course offerings at community colleges. Mesa College phased out Math 96 and there are currently no sections being offered. Support Course Models “x” classes to refresh material is the model being implemented. Returning students (adult learners, veterans, single mothers) that may have for a multitude of reasons chosen to take Math 96 are not allowed the choice to take an algebra course.

The effect of AB 705 implementation has not been properly vetted State wide in terms of the effects on science success rates. Physics and chemistry are required courses for Biology and Engineering Majors (top majors) and these subjects rely on strong algebraic abilities. There is a fluency in mathematics knowledge required for science courses. Data shows that students' ability to successfully complete chemistry and physics courses is linked to their math levels. The important connection between math knowledge and science courses' success rates was not taken into account with the legislation.

The prerequisite for Chemistry 152 is Math 96 or M50. However, due to AB 705, most students are clearing the M50 level and can register for Chem 152 without actually being prepared with the algebra skills needed for the course. From data provided by IE, many students are taking Math 116, 104, or 119 concurrently with Chemistry 152. However, students may not have the algebra skills. Students can clear M50 with three years of high school math (IM 1, 2, and 3). It also means that a student can potentially take Chemistry 152 without having had math in high school senior year. Many students enrolling at Mesa are not coming directly from high school. So, recency of math is undoubtedly an issue. Many may clear M50 without having any recent recollection of algebra.

Summary and Reflection

Chemistry 200 General Chemistry I
Graph 2 shows success rate data disaggregated for Latinx and White students for Chemistry 200 shows a solid success rate for general chemistry- 78% (Sp ‘23) and 71% (F ‘22).
The equity gaps between Latinx students and White students varies from each semester. However, Fall ‘22 and Sp ‘23 show wider gaps of -15 & -19.
However, there is a positive trend. As discussed in the last program review, Latinx students' success rates were most affected by the pandemic with a low point in Sp ‘22. Latinx students' success rates have improved since then and match pre-pandemic success rates. There is still a significant equity gap when compared to white students.

Accelerated Chemistry 200

As one important part of our contribution to the HSI Equity, Excellence, and Exito, Dr. Budzynski developed a course aimed to accelerate students and lower unit requirements thereby saving students time and money. Chem 200 is General Chemistry I Lecture (3 units) ?with a Chem 200L coreq (2 unit lab). ?Chem 152/L prereq (3 + 1 = 4 units) or pass Challenge Exam is the prerequisite. Chem 200 is required for many STEM majors: Chem, Biol, Phys, Enge, and Kinesiology.

In Accelerated Chem 200?, students who have passed Math 121 or higher can skip Chem 152/L?. Chem 20 is the support class coreq (0.5 units) and Chem 200L coreq?uisite. This saves them 3.5 units?.
In Fall 22 + Spring 23, the department offered one section each semester; mixed class with non-Acc students. There were a total of 36 Acc Chem 200 students. Approximately half were Enge majors and a quarter Biology majors.? The success rate 75% (Average overall Chem 200 success rate is 70%)?. Acc Chem 200 Demographics: 31% Asian, 19% Latinx, 39% White? while overall Chem 200 is 15% Asian, 36% Latinx, 31% White?. ?

More data analysis will follow this year as more data will be collected by having more students complete the course and expanding course offerings in Spring ‘24. This will require one more full time faculty member (see need for new hire section).

Chemistry 201

The data from Chemistry 201 is shown in Graph 3. In Fall ‘21 there were no equity gaps between White and Latinx students which is great news. In Spring ‘22, the equity gap was 4% but Latinx students’ success rate was the same as the overall average. The data also shows that F ‘21 and Sp ‘22 had higher overall success rates than F ‘19. The overall success is slightly lower than Sp ‘18, F ‘18, and Sp ‘19, but the equity gaps are significantly better.

Fall ‘22 shows what is hopefully an anomalous semester. The overall success rate matched the college success rate 72%. But the Latinx students only had a 55% success rate compared to 77% for the white students. Spring ‘23 showed a high success rate of 85% with white students having a success rate of 97% compared to Latinx students at 77%.
There is not an explanation to this data and more analysis will come next program review.

Organic Chemistry-Chemistry 231
Organic Chemistry is a course that is taken by most biology and all chemistry majors. Our program is smaller than General Chemistry. Graph 4 shows an increase in success rates for overall success rates, success rates for white and Latinx students in Chem 231 in Spring ‘23. In Fall ‘22, there was no data for Latinx students meaning that the number was lower than 10 students. The organic chemistry program appears to be strengthening and this is in part due to expanding our team to two devoted Organic Chemistry professors (Saidane & Chang). Our new tenure track professor, Dr. Chang, has certainly been an excellent addition to our program.

Chemistry 233

The success rate for Chem 233 for Fall 2022 is 65% and for Spring ‘23 was 90% compared to 77% in average of Sp 18, F 18, Sp 19, & F19. There is clearly not an overarching trend. There are not enough enrollments ~20 each semester to disaggregate the data.
Success Rates in Allied Health Track

Summary and Reflection

The following Table 7 shows a comparison of the Allied Health Courses:

All of the courses in our Allied Health Track exceed the overall college success rates in Fall ‘22 and Spring ‘23.

Chemistry 100 has an equity gap. Latinx students have a 65% success rate in Chemistry 100 in Spring ‘23 vs. 85% success rates for white students. Latinx students have a 81% success rate in Chemistry 100 in Fall ‘22 vs. 90% success rates for white students. Disaggregation of the remainder of the courses is not available due to lack of number of students.
General Education Course-Chem 111

This course has a high success rate of Fall 2022 (75%) and Spring ‘23 (79%) which is slightly lower than the average success rate of 83% in Sp 18,F18,Sp 19, F19. This course is a great course to promote sustainability. Please see the Sustainability section of this document.

Laboratory Courses
Chemistry courses have co-requisites that provide hands-on and active learning to supplement the lecture. Chemistry lab provides a way of visualizing abstract concepts in a physical way.
In addition, students are encouraged to discuss their data as a class. In appropriate cases, they work in small groups. Laboratory is a way is a fantastic way to foster camaraderie among students and professors. Our success rates in all laboratory courses exceed college success rates (Table 8).

Review Outcomes Report. Review the unit’s outcomes assessment process for 2022 - 2023. Discuss connections to unit goals/action plans/resource requests.

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 2.
Significant Impacts of AB 1705

This academic year of Fall 2022-Spring 2023 and in light of the “post” pandemic learning and teaching obstacles, the Department has put all its efforts to provide as much support as possible to students in numerous ways. Our department is extremely active in participatory governance, campus wide committees, and the HSI Equity, Excellence, and Exito (E-3) Grant. We support high quality and culturally relevant curriculum as part of every day teaching. Many of our contract faculty members support Honors Contracts that allow students to make relevant connections to important research.

The Curriculum Work Group HSI E-3 Grant has five Chemistry full time faculty who have taken initiative in participating in the HSI Excellence, Equity, and Exito since Fall 2021. This is interdisciplinary work focusing on the elimination of barriers and to provide support for students entering Mesa College. We are collaborating heavily with the faculty from physics, math, engineering, and biology. This has led to many projects that will require a faculty lead to institutionalize a significant overhaul of General Chemistry.

The work group is discussing how AB 1705 will affect science courses. AB 1705 seeks to further remove choices for students to select the appropriate math journeys. Currently, Mesa course offerings offer students a wide variety of entrance points into mathematics and include both non-support and support options: Math 116/Math 116x (College Algebra and Matrix), Math 104/104x Trigonometry, and Math 141/141x Precalculus. Students have choices in their math journey. AB 1705 legislation seeks to validate the need for any course including transfer level courses such as Precalculus (Math 141) by Fall 2025. Mesa STEM faculty are extremely concerned that the validation process at the state level is not transparent and many questions remain on validation studies. The validation process currently used on validating precalculus for business majors would be flawed if the same approach is used for validating precalculus for STEM majors. In addition, if validation is not shown, the most strict interpretation places ALL students in calculus. We support students with four years of math being able to register into Calculus without any barriers. We strongly oppose forcing ALL entering community college students into Calculus.

Summary and Reflection

Students with two or three years of high school math should have the choice to take a one semester Precalculus course. Returning students, in particular Veterans that are adult students, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to teach Pre-Calculus. The double standard of not allowing community college students to take a precalculus is inequitable.

In addition, the use of support course models for Calculus fails to meet common sense and learning theory pedagogy. Teaching Calculus with a support course involves 6-8 hours a week of Calculus lecture + support (lab). Algebra, trigonometry, and precalculus are introduced while teaching Calculus. This places an undue burden on students and faculty. In addition, for students with less math preparation, students are not reviewing or refreshing information.

Important questions from Mesa Chemistry remain. Since most students begin their path with Chem 152 and Math.
How will working students be able to register for other courses if the time and unit demand is so high for Calculus?
Will Latino students be most impacted by the legislation?
How will this affect our enrollment of Latino students in our pathways?

YEAR 3 Updates (2024 - 2025)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 3.
Currently, there are 9 full time faculty members (and will be 10 in Sp 2025) and 21 adjuncts in the department. Adjunct FTEF is 10.8 for Fall 2024 which is 54% of our total FTEF. There are three Instructional Laboratory Technicians (ILT). We are currently in the process of hiring an ILT to return to our normal staffing.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 3.

For a much easier to read format, PLEASE READ THE ATTACHED DOCUMENT The graphs will be shown in that document and did not copy into here.

The Data dashboards used for this data is Mesa College Course Outcomes Dashboards
The enrollments have changed over time (Table 1). Since last Program Review focused on pandemic teaching and trend, the goal of this Program Review will be to discuss changes to enrollment and success rates pre-pandemic face to face average of Sp ‘18, Fall ‘18, Sp ‘19, and Fall ‘19 compared to face-to-face Fall ‘21, Spring ‘22, Fall ‘23, and Spring ‘24.
TABLE 1-ENROLLMENT BY SEMESTER
Semester
Enrollment

Spring 2018 2658
Fall 2018 2786
Spring 2019 2859
Fall 2019 2680
Spring 2020 2773
Fall 2020 2625
Spring 2021 2613
Fall 2021 1924
Spring 2022 1762
Fall 2022 1979
Spring 2023 2165
Fall 2023 2253
Spring 2024 2342
Fall 2024 2382

Enrollment has been steadily climbing back since the low point in Spring 2022. Our department prides itself on excellence in managing enrollment. Our fill rates exceeded 101+% in Fall 2024. We believe that our department’s commitment to excellence

Summary and Reflection

in a supportive and positive learning environment draws students to Mesa College Chemistry.
Currently, there are 9 full time faculty members and 21 adjuncts in the department. Adjunct FTEF is 9.0 for Fall 2023 which is 46% of our total FTEF. There are three Instructional Laboratory Technicians (ILT). We are currently in the process of hiring an ILT to return to our normal staffing.

Last few semesters FTEF, fill rate, and productivity

Semester	FTEF	Fill Rate	Productivity
F24	20.0	101%	15.26
S24	20.0	97%	14.88
F23	19.8	96%	14.54

General Chemistry is driving the high fill rates. This semester we have 152 (105%), 200 (108%), and 201 (104%). Similar high fills for those classes in S24 well, and 152 and 200 were over 100% in F23. FTEF planned for S25: 20.4. Pre-pandemic we were at 24.4 FTEF (Sp 20). Rob Fremland retired after F23. Dwayne resigned after S24. We will lose some long-time adjuncts in Gen Chem: Mona (0.6 FTEF) left with Bahman (0.6 FTEF) leaving after this semester. We have been hiring new adjuncts every semester, but some leave after taking full time jobs and others have scheduling conflicts. We would like to increase our FTEF even more, especially in General Chemistry, but finding adjuncts has become more difficult. For example, we were granted more FTEF for Sp 25 but could not add those sections due to lack of qualified faculty. There would have been enough FTEF for Sp 25 to easily fill two new contract spots, without impacting current adjuncts. We did hire one new contract, who will be starting in Spring 25.

The trends in Success Rates Disaggregated by Ethnicity in Chemistry are listed in Table 2. Note that the percentage of students enrolled in our course

Overall trends in Fall 2023-Spring 2024
Overall chemistry success rates match or exceed college success rates. Fall ‘23 was a 74% success compared to the 74% success rate of the college. Spring 24 was an 80% success rate compared to a 76% college success rate.
This overall success rate in Spring 2024 was the highest success rate in the ten semesters shown above! This could be attributed to very high success rates in Chemistry 200/200A.
White and Asian students exceed the overall chemistry success rates in all the semesters shown in Table 2.
Latinx students represent a consistent percentage (~37%) of our students. This is lower, but similar to the campus representation of Latinx students (~40%).
Latinx student success rates tend to be fairly consistent between semesters, but lower than the average overall success rates with the exception of Spring 24 where Latinx success rates in chemistry matched the college success rate.
An equity gap exists for Latinx students. This gap and interventions will be discussed further in the next section.
Black/African American students represent a very small percentage of our total student demographic. The percentage (~4% average) is lower than the campus representation (6%). This underrepresentation of Black/African American students will be discussed further in the next section. Black/African American student success rates in chemistry tend to fluctuate. The small number of Black/African American students in our classes makes it difficult to discuss trends. Fluctuations in drops will significantly affect the overall success rates.

Student Success Rates at Course Level for Fall ‘23-Sp ‘24 Update
Mesa College Data Dashboard for the department overall shows a similar success rate to the overall campus success rates taking into account data from face to face semesters. This comparison will focus on a comparison of Latinx students & White Students.
At the course level, discussions of Black/African American success rates become difficult due to the small numbers of students. In most classes after Chemistry 200, the numbers do not allow for the statistics to be recorded on the dashboards. Small changes in enrollments lead to large changes to success rates due to small numbers of students.
Note: This discussion will focus on Comparing Fall 23 and Spring 24 to previous on campus semesters (Sp 18, F 18, Sp 19, F19, F 22, Sp 23).

Chemistry 152: Preparation for General Chemistry
Graph 1 shows an equity gap for Latinx students of -19% for Fall ‘23 and an equity gap of -15% for Sp ‘24 that is consistent

with pre-pandemic equity gaps.
Despite our best efforts, educational trends and legislation are making strides for lowering equity gaps difficult. As science educators, we would be remiss to not discuss the impacts of AB 705 from the perspective of science education. AB 705 removed Intermediate Algebra from our course offerings at community colleges. Mesa College phased out Math 96 and there are currently no sections being offered. Support Course Models "x" classes to refresh material is the model being implemented. Returning students (adult learners, veterans, single mothers) that may have for a multitude of reasons chosen to take Math 96 are not allowed the choice to take an algebra course.
The effect of AB 705 implementation has not been properly vetted State wide in terms of the effects on science success rates. Physics and chemistry are required courses for Biology and Engineering Majors (top majors) and these subjects rely on strong algebraic abilities. There is a fluency in mathematics knowledge required for science courses. Data shows that students' ability to successfully complete chemistry and physics courses is linked to their math levels. The important connection between math knowledge and science courses' success rates was not taken into account with the legislation.

The prerequisite for Chemistry 152 is Math 96 or M50. However, due to AB 705, most students are clearing the M50 level and can register for Chem 152 without actually being prepared with the algebra skills needed for the course. From data provided by IE, many students are taking Math 116, 104, or 119 concurrently with Chemistry 152. However, students may not have the algebra skills. Students can clear M50 with three years of high school math (IM 1, 2, and 3). It also means that a student can potentially take Chemistry 152 without having had math in high school senior year. Many students enrolling at Mesa are not coming directly from high school. So, recency of math is undoubtedly an issue. Many may clear M50 without having any recent recollection of algebra.
We highly recommend that the district allow offering algebra as non-credit as an option for students as other colleges in the state have done in response to 1705.

Chemistry 200 General Chemistry I
Graph 2 shows success rate data disaggregated for Latinx and White students for Chemistry 200 shows success rates for general chemistry- 68% (F '23) and 81% (Sp '24). The latter is the highest success rate in the last ten semesters that are tracked.
The equity gaps between Latinx students and White students varies from each semester. However, Fall '23 and Sp '24 show gaps of -22 & -12.
However, there is a positive trend. As discussed in the last program review, Latinx students' success rates were most affected by the pandemic with a low point in Sp '22. Latinx students' success rates have improved since then and match pre-pandemic success rates. There is still a significant equity gap when compared to white students.

Accelerated Chemistry 200
Chem 200 is General Chemistry I Lecture (3 units) ?with a Chem 200L coreq (2 unit lab). ?
Chem 152/L prereq (3 + 1 = 4 units) or pass a Challenge Exam is the prerequisite. Chem 200 is required for many STEM majors: Chem, Biol, Phys, Enge, and Kinesiology.
As part of the E3 HSI STEM Grant, we have been offering Accelerated Chem 200 since Fall 22. This course has a regular Chem 200 section (3 units) offered with a required Chem 20 section (0.5 units) as a supplemental course. The purpose of this is to allow students with high math levels to skip the prerequisite Chem 152 course and go directly to Chem 200. The Chem 20 course covers the most essential background chemistry 152 topics students need to be successful in Chem 200. Because there are not enough Accelerated Chem 200 students in a given semester to fill an entire section, traditional non-accelerated students who had met the Chem 152 prerequisite were also enrolled in these sections. These students also participated in Chem 20, except during the first semester, Fa 22, where only Accelerated students took Chem 20.

Students with higher math levels (Math 121 or above) were chosen because previous data had 200 are mathematical in nature so it was hypothesized that these students would be most likely to succeed in a faster paced course. These accelerated students would save 3.5 units since they would be skipping Chem 152 and 152L (four units total). This is especially important for high unit majors such as Engineering.
In July 2024, a study was conducted by Mesa researcher Adriana Caetano on the 78 total Accelerated Chem 200 students enrolled during the first four semesters offered from Fa22 through Sp24. The main take away from the study is that Accelerated Chem 200 has been a success. The accelerated students had a 79% success rate, and a 3.09 GPA compared to a 75% success rate and 2.79 GPA for non-accelerated students in the same sections. During this period, the overall success rate for all sections of Chem 200 was also 75%. The full report has been attached in Nuventive.
Thanks to Dr. Budzynski who began this curriculum and taught for many semesters and Dr. Fusco who is currently the lead on

Summary and Reflection

the course.shown these students to be most successful in Chem 152 and 200. Many of the topics in Chem

Chemistry 201

The data from Chemistry 201 is shown in Graph 3. In Fall ‘23 there was a -10 equity gap between White and Latinx students, but Latinx students closely match the college overall success rate. In Spring ‘24, there was not a significant equity gap -1%. Both groups significantly exceeded the college success rates.

Organic Chemistry-Chemistry 231

Organic Chemistry is a course that is taken by most biology and all chemistry majors. Graph 4 shows solid success rates for overall success rates, success rates for white and Latinx students. In Fall ‘23, the success rate was 75% overall with a -9% equity gap for Latinx students. In Spring ‘24, the overall success rate was 81% with a -17% gap.

The organic chemistry program appears to be strengthening overall in the last four semesters. This is in part due to expanding our team to two devoted Organic Chemistry professors (Saidane & Chang). Our new tenure track professor, Dr. Chang has certainly been an excellent addition to our program.

With the impending retirement of Dr. Saidane in May ‘25, it will be important to hire a full time tenure track Organic Chemistry professor in order to maintain the improved program.

Chemistry 233

The success rate for Chem 233 for Fall 2023 is 87% and for Spring ‘24 was 81% compared to 77% in average of Sp 18, F 18, Sp 19, & F19. It appears that last year, the success rates are improving in this class. There are not enough enrollments ~20 each semester to disaggregate the data.

Success Rates in Allied Health Track

The following Table 7 shows a comparison of the Allied Health Courses:

All of the courses in our Allied Health Track exceed the overall college success rates in Fall ‘23 and Spring ‘24 with the exception of Chem 100.

Chemistry 100 has an equity gap of -10% in both Fall ‘23 and Spring ‘24. Disaggregation of the remainder of the courses is not available due to lack of number of students.

General Education Course-Chem 111

This course had success rates of Fall 23 (61%) and Spring 24 (95%) which were inconsistent from the average success rate of 83% in Sp18, F18, Sp19, F19. This course is a great course to promote sustainability. Please see the Sustainability section of this document.

Laboratory Courses

Chemistry courses have co-requisites that provide hands-on and active learning to supplement the lecture. Chemistry lab provides a way of visualizing abstract concepts in a physical way.

In addition, students are encouraged to discuss their data as a class. In appropriate cases, they work in small groups. Laboratory is a fantastic way to foster camaraderie among students and professors. Our success rates in all laboratory courses exceed college success rates (Table 8). The laboratory courses show consistently solid success rates.

Chemistry 251-Analytical Chemistry

This course is an important course for chemistry majors as it is required for transfer preparation for SDSU. Chemistry 251 was offered for the first time in Spring 2024 since Spring 2020. The success rates are shown in Table 9.

Dr. Chadeghani with the mentoring of Dr. Budzynski allowed for the revival of this course. There is a learning curve in teaching this course since it is heavy on instrumentation. The success rates can be analyzed further as we can continue to offer the course each Spring.

This course highlights the need for qualified Instructional Laboratory Technicians. It has been very difficult to hire and keep ILT in our department over the last 4 years. Our department feels that it is necessary to increase wages for Chemistry ILTs in order to attract and keep qualified people. (see goals)

Need for New Faculty

The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment. To this end, the Department has taken leadership roles and participated in many events and programs to help students feel welcomed and supported. We have pivoted in so many ways and always worked as a team to provide quality learning for our students. These transitions required constant re-writing and adjusting of course materials and countless hours

Summary and Reflection

of work from our faculty. The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment. It is our belief that our department needs one additional full time faculty member to join our team of educators. We need an equity minded Organic Chemistry instructor. This is for reasons that will be explained in this narrative. In addition, we would like a faculty member that has an interest in forming partnerships with outside institutions and bringing research collaborations with four year colleges and universities.

The Chairs and Senior faculty of the Chemistry Department are excellent new faculty mentors. We assign each new faculty a mentor who works with them throughout their tenure process. Additionally, the department works to maintain a supportive, nurturing space for all department faculty. This has led to two of our tenure track faculty recently being tenured, and our most recent faculty hire being quickly integrated into the department activities and comradery. This requires regular meetings, as well as constant office/hallway discussion of everything from activity organization, to teaching techniques, to course content and pacing. It is a constant and regular part of our days for new, as well as senior faculty. It is what makes our department run so well and how we can easily integrate one new contract faculty member into the mix. We are requesting one more full time faculty member and our data shows that we are able to justify this request.

One of our full-time faculty members actively involved in our Organic Chemistry program will be retiring by May 2025. Additionally. Dr. Gergens officially resigned in Spring 2024. He was also part of our Organic Chemistry sequence. The expertise required for the course is specific and when Dr. Saidane retires, it will be difficult for us to properly staff our organic program. Therefore, it is critical that we have a replacement in the next hiring cycle.

As this program review discussed above, Organic Chemistry track has been steadily increasing each semester since the pandemic. This track is so important to allow students to complete the sequence in a small supportive environment. This contrasts the large impersonal and sink or swim environments of O-Chemistry at four-year universities. ADD sequence

Our department has worked tirelessly to help students through the supportive student-facing interventions described in the excellence section below. This includes participation in Path to Stem Success, HSI E-3 Grant projects, and Peer Mentoring/Faculty Workshops. We need one full time faculty member that will focus exclusively on Organic Chemistry and form a team with Dr. Chang (our current full time tenure track professor) and replace Dr. Saidane who retires in May 2025. The expertise required for the course is specific and when Dr. Saidane retires, it will be difficult for us to properly staff our organic program. Therefore, it is critical that we have a replacement in the next hiring cycle.

Program Involvement: Department and College

In the academic year of Fall 2023-Spring 2024, the Department has put all its efforts to provide as much support as possible to students in numerous ways. Our department is extremely active in participatory governance, campus wide committees, and the HSI Equity, Excellence, and Exito (E-3) Grant. We support high quality and culturally relevant curriculum as part of everyday teaching. Many of our contract faculty members support Honors Contracts that allow students to make relevant connections to important research.

Dr. Fusco has led the development and expansion of zero cost online homework for Chemistry 152 and Chem 20. This time-consuming endeavor has been very successful and been adopted by five other instructors. This was surveyed and it was given a 4.8/5.0 with 38/48 students responding. The students' comments were very positive regarding built in student support.

Ms. Danica Moore has been the Professional Development Lead for the grant. She recruited 30 faculty in the Math and Natural Sciences faculty to participate in ESCALA in Spring 2024-December 2024. Dr. Fusco is one the ESCALA Table Leads on the program. Dr. Chang and Dr. Chadegani along with two adjuncts from the Chemistry department participated in this important equity minded program.

Dr. Gustin is the lead on the Curriculum Work Group (CWG) HSI Equity, Excellence, and Equity Grant. The CWG had six Chemistry faculty participate last year (Dr. Budzynski, Ms. Moore, Dr. Fusco, Dr. Chang, Dr. Chadeghani, and Dr. Sardo). This is interdisciplinary work focusing on the elimination of barriers and to provide support for students entering Mesa College. We are collaborating heavily with the faculty from physics, math, engineering, and biology. This year, our group helped Biology Chair Dr. Brahmbhatt finalize the Biology pathways and 2, 3, and 4 year plans that can help students.

Dr. Sardo and Dr. Saidane have been strong senators at the Academic Senate. They have voiced our concerns over safety issues at the college that we feel needed to be discussed and fixed. Dr. Sardo and one adjunct have done the C-Cert Training. Dr. Chadeghani completed the active shooter training. The chemistry department is committed to safety training that can help to better prepare for earthquakes, emergencies, and school shootings. We hope that the college continues to improve in its commitment to keep the campus safe.

Summary and Reflection

Dr. Budzynski and Dr. Gustin worked with Mathematics Chairs Juan Bernal and Ken Kuniyuki to bring awareness and legislative changes to an extremely unequitable law, AB 1705. The chemistry department adamantly opposes AB 1705. AB 1705 seeks to further remove choices for students to select the appropriate math journeys that are critical to student success in chemistry. Data was referenced above that shows that student fluency in math is critical to success in our program. We strongly oppose forcing ALL entering community college STEM students into Calculus. Students with two or three years of high school math should have the choice to take a two course sequence in precalculus/trigonometry. Returning students, in particular Veterans that have been out of school for a while, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to take Pre-Calculus. The double standard of not allowing community college students to take precalculus is inequitable.

Summary of our advocacy against AB 1705:

1. Communicated via email John Hetts (Vice Chancellor of IE at State Chancellor Office) & Dr. Lowe's Office regarding our concerns over the data collection and the negative impacts of the law on science education.
2. We attended to the State Chancellor's/RP Group Webinars on Mar 7th (Spotlight on STEM Calculus 1: Impact of Preparatory Pathways on Completion) and March 4th (AB 1705 Equitable Placement, Support, and Completion STEM Validation of Practices) regarding the validation of the prerequisites for STEM Calculus. We analyzed the RP Group study (Preparatory Pathways and STEM Calculus Completion: Implications of the AB 1705 Standards). Because of our teams' expertise in statistics and science, we have concluded that the statistical sampling and methodology used by the RP Group study (Preparatory Pathways and STEM Calculus Completion: Implications of the AB 1705 Standards) is invalid. It needs to be retracted and independent groups should audit their work. We believe that RP Group should be defunded as they have abused their power in a taxpayer institution.
3. Mr. Bernal, Dr. Gustin, Dr. Budzynski, and Student Leaders addressed the San Diego Community College Board of Trustees stating our opposition to the legislation.
4. Mesa Chemistry Department supported an OpEd article for SD Union Tribune written by Mathematics faculty.
5. We developed partnerships with City College faculty, Grossmont College, and Southwestern College.
6. We met with Chancellor Smith, Vice Chancellor of Instruction Susan Topham, and Dean of Instructional Services Shelly Hess.
7. Dr. Budzynski, Dr. Gustin, Juan Bernal and ASG Student Leaders met with Assemblyman Christopher Ward. We met with Assemblywoman Tasha Boerner. There were a total of 5 assembly representatives that were visited.
8. Dr. Lowe met with Dr. Budzynski and Ken Kuniyuki (Math).
9. We met with the UC San Diego Mathematics Department who concurred with our assessment of the RP Group's Data.
10. Dr. Budzynski, Ms. Danica Moore, Juan Bernal, and Paula Gustin addressed the Board of Governors.
11. Assemblyman Ward contacted us to meet with his State Legislator underwriter to discuss changes to the legislation.

The department would like to express how upsetting it has been to have our expertise dismissed by the State Chancellor's Office & Legislators. Our department does not feel supported. We don't believe that we work in a healthy vibrant professional environment where we are valued as employees, science educators, and scientists. Our department works hard to be there for students. Students have choices of where they want to study chemistry. Our high fill rates, success rates, and evaluations explain why they chose to be at San Diego Mesa College for their chemistry. This legislation directly impacts our ability to do our jobs.

Highlights our department's commitment to equity and excellence.

*Timely Assessment of Student/Course Learning Outcomes

Thanks to Dr. Saidane who represents us at the college campus wide committee on Course Learning Outcomes. Our department is on track to assess all of our courses and the four Course Learning Outcomes that were refined and adjusted. The department is using this information to make data driven requests such as institutionalization of Peer Mentoring Model and Faculty Workshops provided by AB 1705 funds.

*ESCALA participation (see above)

*Amend/Repeal AB 1705 at state level (see above). Defund RP Group!

*Peer Mentoring Lead:

Dr. Chang and Dr. Fusco have been actively involved in the Peer Mentoring Program. We had 6 Peer Mentors in Spring 2024 and 5 in Fall 2023. Participation of the students is very high with 225 students which is 25% of General Chemistry/Organic

Summary and Reflection

Chemistry I students participating! Chemistry non-participants' success rate is 73% and course GPA 2.61. Peer Mentor participants that went fewer than 10 times had an 87% success rate and course GPA of 2.98. More than 10 times was 90% success and course GPA 3.24.

*Participation in Classroom Tutoring Program:
Chemistry 100 instructors (Ms. Moore) and Dr. Chadeghani (Chem 152) participated in mentoring classroom tutors. This is a great way of providing more support for students. During this timeframe, Classroom Tutoring (under MT2C) provided tutors that would work with students 3 hours a week. (See concerns below). But, we are not supported in this area. (See section below).

*Path to STEM Success:
In Summer 2024, the program merged with Summer Cruise and 100 students participated. It has received much positive feedback and campus accolades. This program continues to grow under Dr. Fusco's leadership.

*Enrollment Management-
Chemistry has taken an active role in participating in campus efforts to write an Enrollment Management Plan. Dr. Budzynski is the lead faculty member in this campus wide effort. Our department sees equity in the details especially in providing a reliable and managed schedule with minimal cancellations. Kudos to Dr. Budzynski with her acumen in building a schedule with high productivity and that is student centered.

*Faculty Led Workshops Lead: Total 20+ sessions, 196 total visits = 7.3 students on average per session.

*Dr. Chadegani is leading the Classroom Redesign project for MS 422 to be completed by Fall 2025.

* Study Jams Lead: Dr. Fusco worked with the Mathematics department to offer sessions over Intercession 2024 and Summer 2024. 30 students attended per session. Chemistry and Math are the subjects that students are seeking help in.

*ACS Chem Club: Dr. Chang continues to be the faculty advisor of the San Diego Mesa College ChemClub and active in the San Diego local American Chemical Society Section. Besides organizing campus events, the club participated in the ChemExpo last Fall, visited Pfizer Pharmaceutical Company in November 2023 and the General Atomic DIII-D National Fusion Facility in Spring 2024. This Fall, the club is occupied with several on-campus Green Chemistry events (The first one, Bioplastic-making rice paper, was completed in September), Encina Wastewater Pollution Control facility tour in November, and a poster presentation in the San Diego ACS National meeting in March. Currently, Dr. Chang is working with the Office of Student Affairs for the application of a professional travel grant that will help pay for several student's ACS National meeting registration. A student club is best to welcome diversity and equity.

Sustainability
Our students show a strong interest in environmental issues and sustainability and our department has an environmentally focused curriculum in many courses. Our Chemistry 111/111L which discusses climate change, water and air pollution, and the disproportionate impact on communities of color. Many of our laboratory courses-Chem 200L and 201L- which serve our STEM majors of engineering and biology have laboratory analysis that is related to the environment. This is particularly focused on water pollution. There has also been an active effort on the part of our six Lab Coordinators to participate in Green Chemistry Lab Redesign to reduce chemical usage, and substitute more environmentally friendly chemicals into experiments where possible.

Chemistry Department Concerns Regarding Lack of Support for Institutionalizing Peer Mentoring
Over the last year, Mesa Chemistry Department has been actively involved in Peer Mentoring. The program has been an amazing asset in our equity efforts. Over the last year, 225 students have attended Peer Mentoring. It has become an important component of our General Chemistry & Organic Chemistry Program. It builds strong relationships for the students with the faculty. It allows the Peer Mentors to develop their communication skills.
We are concerned that this amazing program that is part of our department will end with the end of the grant in Spring 2026. The Peer Mentor Model works for us! As professors, we can encourage students to be Peer Mentors. This is always with an equity focus. Many times we try and recommend students that may have never seen themselves in a leadership role. The interview process is straightforward. Students receive training and then are hired fairly quickly. They can begin the next semester. They work closely with faculty. Students feel comfortable with them because they tend to be of similar age and

Summary and Reflection

shared experiences. They also will have just taken the class they are mentoring.
We had six Peer Mentors in Spring 2024 and five in Fall 2023. Participation of the students is very high with 225 students which is 25% of General Chemistry/Organic Chemistry I students participating! Chemistry non-participants' success rate is 73% and course GPA 2.61. Peer Mentor participants that went fewer than 10 times had an 87% success rate and course GPA of 2.98. More than 10 times was 90% success and course GPA 3.24.

Our experiences with MT2C are not the same and we have concerns that have been voiced over the last five years in meetings and directly to the MT2C staff and leadership. Here is a summary of our experiences. Although we work with the staff at MT2C to interview and place students, the MT2C model for approaching our needs as a department is lacking.
The students have to take Education 100 before even applying and there is no guarantee of employment. ED 100 extends the time that students are hired.
The tutors do not typically work closely with faculty.
Classroom tutoring hours have been cut from 3 hours with students to 1 hour with students
Responses to requests for Classroom Tutors are slow. It is unclear if any will be processed in time for Spring 2025.
There is a major disconnect between the needs of the department and how MT2C Tutoring is run as a department. Why is this being mentioned? Chemistry accounts for one of tutoring's largest demand subjects to be tutored. 80% of the tutoring requested from MT2C is from Chemistry and Math. Yet, our faculty and student needs are dismissed.

We are concerned that when Peer Mentoring ends that the Chemistry students will have essentially no support from tutoring, yet we have a LARGE demand from students for tutoring.

Future Work & Goals for Chemistry Department
The Chemistry Department has numerous goals for the next academic year.
Goal 1: Continued involvement and leadership in the HSI Equity, Excellence, and Exito Grant. Currently, five chemistry faculty are heavily involved in the grant. Dr. Fusco Hernandez is the Principal Investigator, Dr. Paula Gustin is the faculty chair of the Curriculum Work Group, Ms. Moore is Professional Development Lead. Dr. Chadegani is the chairing the Classroom Redesign Project. IN PROGRESS
Goal 2: Analyze data from the Acceleration Chemistry 200 Project in the next Program Review Year. General Chemistry faculty are working through the Interdisciplinary STEM Curriculum Writing Group, focusing on pathways for students to accelerate in the General Chemistry path for students with higher math levels. -DATA ANALYSIS COMPLETED
Goal 3: Hire two faculty- one for General Chemistry & one for Organic Chemistry. In light of impending retirements and enormous amounts of faculty participation in college, it is critical that we obtain a replacement for Dr. Gergens and Dr. Saidane-IN PROGRESS
Goal 4: Create more student-centered spaces: Under Dr. Chadegani, we are looking forward to redesigning a classroom to be a warm, inviting space for instructor and student interaction. -IN PROGRESS FOR COMPLETION BY FALL 2025
Goal 5: Increase representation of African American students:
The goal of the department will be to seek ways to improve the numbers of African American students in General Chemistry and Organic Chemistry to at least match the 6% representation of the college. One approach is to work more closely with counseling. Recruiting and retaining African American students in STEM will require more community outreach with high schools and working closely with a counseling representative. Actively recruiting for our Chemistry Club may also be a possible venue to support Black/African American students. -IN PROGRESS
Goal 6: Increase Work Based Learning Opportunities for students.
Working with the Faculty Work Based Learning STEM Coordinator, we can provide more opportunities for students in the area of work based learning. -IN PROGRESS
Goal 7: Analyze Enrollment Trends and Latinx Representation in Organic Chemistry
Survey Chemistry 201 students to learn more about their plans for Organic Chemistry. Are they transferring before taking this class? This will help us to determine enrollment trends and perhaps understand why the Latinx representation is lower in that sequence. -IN PROGRESS
(NEW) Goal 8: Focus on Curriculum Alignment
Discuss topics in Chem 152-200-201. Also included in this discussion are laboratory classes and how we can standardize lab skills, notebook, and group vs. individual work.
Chem 100-130-160 with emphasis on key skills needed for allied health majors
(NEW) Goal 9: Reclassification of Instructional Laboratory Technicians Payroll

Summary and Reflection

Review Outcomes Report. Review the unit's outcomes assessment process for 2023 - 2024. Discuss connections to unit goals/action plans/resource requests.
Student/Course Learning Outcomes (CLO/SLO) Update for Fall 2023/Spring 2024 & CLO Action Plan

Chairs worked on ensuring that all syllabi in the department contained the correct student learning outcomes.
The department assessed all of our courses for the following Course Learning Outcomes: Lecture: Use and/or understand accepted standards in measuring and analyzing data/mathematical applying models/calculations. Lab: Write detailed discussion and summary of results. Draw conclusions that correlate to the purpose of the experiment and show a clear understanding of the experiment.
We met during Fall 2024 to discuss the assessment results to review the results and determine ways of improving. Most of our lecture courses met a threshold of 70% or above on the assessment and all laboratory courses meet a ? on the departmental rubric for laboratory. Even if courses did meet the assessment targets, we discussed in what ways we can further support students to improve. The two courses that did not meet the 70% mark are Chem 152 and Chem 200. The department discussed any ambiguities with the questions that may play a bias in the results. Repeating this with another set of students will be important.
Faculty feel that post pandemic learning loss and the AB 1705 with the loss of our prerequisite algebra courses is deeply affecting us. Algebraic skills are low for students. How will our department help students?

Student/Course Learning Outcomes Action Plan

*Continued our support for Peer Mentoring by participating in peer mentor recruitment and guidance.
*Increased communications and resources for Chem 152 faculty
*Applied for a stipend from AB 1705 funds to have faculty workshops for these courses. These were approved and over 20+ workshops were offered last year.
*Made pathway changes and informed counseling so they can better guide students. This included a detailed document to the counseling department from Chairs that students entering into Chem 152 should take a math course before starting in Chem 152. This is data driven (see data).

*For laboratory courses, we also discussed a new department goal to discuss the curriculum throughout the sequence of courses. This would include notebook usage and the amount of individual vs. group work that the students should do as they progress from course to course.
*Worked with the Math Department to encourage/pressure the District to allow offering algebra as non-credit as an option for students as other colleges in the state have done in response to 1705.
*Working within the HSI Curriculum Work Group to discuss standardized curriculum from Chem 152-200-201 and 100-130-160 so as to better train new tenure track faculty and adjunct professors.
*Working to institutionalize Chemistry 200 Acceleration (see section below).

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 3.
The San Diego Mesa College Chemistry Department continues to provide high quality instruction. Our faculty give 100% to students and the college.

Sadly, our department does not feel fully supported by SD Mesa College and SDCCD. AB 1705 has already affected our Chem 152 success rates and this is a gateway course to STEM for underserved groups. We encourage District to offer algebra as a non-credit option like other colleges in the State of California. Also, we are seriously concerned about losing Peer Mentoring as our tutoring model. Institutionalize Peer Mentoring!
Until these issues are properly addressed by Campus and District Leadership, there is a disconnect for our department and the College. Please see the above section in Program Review for the details.

Summary and Reflection

YEAR 4 Updates (2025 - 2026)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 4.
Currently, there are 9 full time faculty members and 20 adjuncts in the department. Adjunct FTEF is 11.4 for Fall 2025 which is 54% of our total FTEF. There are four Instructional Laboratory Technicians (ILT). We have just this month (November) returned to full staffing in the ILT team.

Last few semesters FTEF, fill rate, and productivity
Semester
FTEF
Fill Rate
Productivity
F25
21.167
103%
15.66
SP25
20.367
102%
15.58
F24
19.97
101%
15.27

General Chemistry is driving the high fill rates. This semester we have 152 (106%), 200 (107%), and 201 (101%). Similar high fills for those classes in S25 well, and all three courses were over 100% in F24. This semester, we added an additional section of 200. Chem 152L is limited by lab room space, and Chem 200L and 201L are reaching that limit as well. FTEF planned for S26: 23.034. The need for additional faculty is present and more laboratory space as outlined in the main section of this document.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 4.
For a much easier to read format, PLEASE READ THE ATTACHED DOCUMENT . The graphs will be shown in that document and did not copy into here. It is in Nuventive as Fall 2024 Program Review.

CHEMISTRY PROGRAM REVIEW FALL 2025
Prepared by Dr. Paula Hjorth-Gustin

Chemistry is considered to be the central science because physics, engineering, biology, and allied health majors, and many other majors require courses in chemistry. Because of this, the Chemistry Department offers many courses ranging from preparatory chemistry, general chemistry, organic chemistry, analytical chemistry, allied health prerequisites, and a general education course with an emphasis in environmental issues.

The Chemistry Department creates a supportive learning environment that spans across our curriculum. We constantly assess our student success across courses that form a sequence (e.g. Majors Preparation Track 152->200->201 or Allied Health Track 100->130->160). Our department works hard to establish a set core of standards so that students can succeed as they move through our courses. Laboratory courses provide an equitable way to present hands-on learning that supports lecture material. Laboratory work also provides a venue for students to work collaboratively and make STEM relationships that can support them through their courses. The Chemistry department prides itself on having student centered teaching and providing high quality equitable instruction grounded in standards for scientific work that will allow students to be successful at four-year schools. The hallmark skills that our department fosters are critical thinking and hands-on experiential learning. Our professors use lecture presentations, small group discussions, worksheets, application to the real world, and hands-on laboratory training to help students understand and learn what is considered to be a very difficult and intimidating subject.

Summary and Reflection

The Chemistry Department is committed to preparing students for transfer to four-year schools and provide a foundation in future work in science or professional schools. During Fall 2024-Spring 2025, there were 8 associate degrees in chemistry and 16 degrees in Liberal Arts and Sciences Science Studies-Chemistry conferred. This is similar to the previous years.

Our departmental goal is to create a positive learning environment where students feel supported to reach their potential as STEM students. San Diego is a STEM hub and has two of the most highly ranked schools for STEM in the State: UCSD and SDSU as our transfer institution. We take pride in preparing students for transfer and honing in on their analytical and critical thinking abilities. This is a process for students as they make their way through our courses to achieve their dreams of becoming scientists, engineering, pharmacists, doctors, nurses, physical therapists, and environmental scientists. Chemistry does not have many students majoring in chemistry (see previous paragraph). However, we are a highly enrolled program due to our role in supporting Biology (both Biology Majors and Allied Health Majors) and Engineering Majors. Our Department has worked together as a team and is proud of the work they have achieved to reduce barriers to student success. The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment.

The philosophy of the department is to be student centered and equitable while upholding standards of excellence in scientific and critical thinking. Standards are important to our department while providing an engaging, supportive, and positive learning environment. This is achieved by communicating clear expectations to students, student centered pedagogy, equitable teaching practices, open door attitude to students, updating and improving laboratory courses, support courses, participation in embedded tutoring programs and Peer Mentoring, close relationship to counseling, and a focus on equity. Participation in and leading Professional Development training and opportunities in the college is also an important practice in the Chemistry Department. Many of our faculty participated in ESCALA and the STEM Conference last year.

Many faculty within the department are actively involved in leadership positions on campus to participate in shared governance with heavy participation in the HSI Equity, Excellence, and Exito Grant, Peer Mentoring Program Liaisons and Tutoring Liaisons, and Work Based Learning Coordinators, and Faculty Co-Chair of the College Wide Enrollment Management Committee, and Faculty Chair of the Professional Advancement Committee.

Analysis of Enrollment Trends
The Data dashboards used for this data are the newly improved Mesa College Course Outcomes Dashboards
The trends in enrollment are returning to pre-pandemic levels. The need for additional faculty, laboratory space, and instrumentation updates will be discussed.

TABLE 1-ENROLLMENT BY SEMESTER-SEE ATTACHED FILE
Semester Enrollment

Enrollment is significantly rising since the low point in Spring 2022. Our department prides itself on excellence in managing enrollment. Our fill rates exceeded 102+% in Fall 2025. We believe that our department's commitment to excellence in a supportive and positive learning environment draws students to Mesa College Chemistry.
Currently, there are 9 full time faculty members and 20 adjuncts in the department. Adjunct FTEF is 11.4 for Fall 2025 which is 54% of our total FTEF. There are four Instructional Laboratory Technicians (ILT). We have just this month (November) returned to full staffing in the ILT team.

Last few semesters FTEF, fill rate, and productivity

Semester	FTEF	Fill Rate	Productivity
F25	21.167	103%	15.66
SP25	20.367	102%	15.58
F24	19.97	101%	15.27

General Chemistry is driving the high fill rates. This semester we have 152 (106%), 200 (107%), and 201 (101%). Similar high fills for those classes in S25 well, and all three courses were over 100% in F24. This semester, we added an additional section of 200. Chem 152L is limited by lab room space, and Chem 200L and 201L are reaching that limit as well. FTEF planned for

Summary and Reflection

S26: 23.034. The need for additional faculty is present. Dr. Saidane retired after Spring 2025 and this position is open. Currently, we recently completed interviews to replace Dr. Gergens by hiring a full-time tenure track person for the organic program.

We have been hiring new adjuncts every semester, but some leave after taking full time jobs and others have scheduling conflicts. We would like to increase our FTEF even more, especially in General Chemistry, but finding adjuncts has become more difficult. We were recently granted more FTEF for Spring 26, but are scrambling to find instructors. There was enough FTEF for Spring 26 to easily fill two new contract spots without impacting current adjuncts. We are bringing in four new adjuncts to fill the gap, in addition to the one new contract, who will be starting in Spring 26.

Table 2: Student Demographics
For the Academic Year of F24 - Sp25, the trends in our students' demographics are interesting. The total number of enrollments are 4816 (not including summer).
Overall, we see equity gaps in first generation college students, students receiving aid, and part-time students, and DSPS. There is also a large gap in the non-binary.gender (comprises 42 enrollments out of 4816 total enrollments).
We have more part-time students (2742 enrollments) vs. Mesa full-time students (2,074). The equity gap is -3.6% for the part-time students. Sadly, many of our programs favor full time students. For first generation college students, the equity gap is -6.2% with 1182 enrollments out of 4816 total enrollments. The enrollment of those receiving aid is 3049 with an equity gap of -5.5%.
Other interesting trends are that our program has a higher number of female students to males with a negligible equity gap.
Table 2: Student Demographics F24-Sp25 Equity Gaps SEE ATTACHMENT

The trends in Success Rates Disaggregated by Ethnicity in Chemistry are listed in Table 3.
TABLE 3: Comparison of Success Rates Disaggregated by Ethnicity for Chemistry SEE ATTACHMENT

Overall trends in Fall 2024-Spring 2025

*Overall chemistry success rates match or exceed college success rates. Fall ‘24 was an 81% success compared to the 74% success rate of the college. Spring 25 was a 76% success rate compared to a 77% college success rate.
*This overall success rate in Fall 2024 was one the highest success rate in the ten semesters shown above! This could be attributed to very high success rates in Chemistry 200/200A.
*White and Asian students exceed the overall chemistry success rates in all the semesters shown in Table 3.
*Fall 24 shows a high success rate for Black/African American students than in previous years
*Latine students represent a consistent percentage (~42%) of our students. This is similar to the campus representation of Latine students.
*Latine student success rates tend to be fairly consistent between semesters, but lower than the average overall success rates.
*An equity gap exists for Latine students. This gap and interventions will be discussed further in the next section.
*Black/African American students represent a very small percentage of our total student demographic. The percentage (~4.2% average) is lower than the campus representation (6%). This underrepresentation of Black/African American students will be discussed further in the next section. Black/African American student success rates in chemistry tend to fluctuate. The small number of Black/African American students in our classes makes it difficult to discuss trends. Fluctuations in drops will significantly affect the overall success rates. However, Fall ‘24 shows a high success rate for Black/African American students.

Student/Course Learning Outcomes (CLO/SLO) Update for Fall 2024/Spring 2025 & CLO Action Plan

The faculty worked hard assessing 75% of the 84 Course Learning Outcomes for the cycle and the Department will complete 100% of the CLO assessments by March 2026.

Chairs worked on ensuring that all syllabi in the department contained the correct student learning outcomes. This project is VERY time consuming and labor intensive. This semester showed that some of the syllabi did not have the correct prerequisites.

The department assessed all of our courses for the following Course Learning Outcomes:
Lecture Courses:
CLO #1: Atoms and Compounds

Summary and Reflection

Use current theories to describe atoms and compounds.
CLO #2: Structure and Properties
Describe bonding, name using standard nomenclature rules, and/or write structures of chemical compounds. Correlate the relationships between structure and properties.

Laboratory Courses:
CLO #2. Observation and Data: Following the experimental procedure using proper safety and chemical disposal, record detailed observations and data so that one can troubleshoot or detect errors.
CLO #3. Calculations: Perform calculations using the appropriate equations and units.

We met during Fall 2025 to discuss the assessment results to review the results and determine ways of improving. Most of our lecture courses met a threshold of 70% or above on the assessment and all laboratory courses meet a 3/5 on the departmental rubric for laboratory. Even if courses did meet the assessment targets, we discussed in what ways we can further support students to improve. Faculty feel strongly that AB 705 and the loss of our prerequisite algebra courses is deeply affecting us. Algebraic skills are low for students. How will our department help students?

Student/Course Learning Outcomes Action Plan
*Developed Chemistry 200E-General Chemistry I Accelerated (see section below).
*Continued our support for Peer Mentoring by participating in peer mentor recruitment and guidance.
*Increased communications and resources for Chem 152 faculty.
*Made pathway changes and informed counseling so they can better guide students. This included a detailed document to the counseling department from Chairs that students entering into Chem 152 should take a math course before starting in Chem 152. This is data driven (see data).
*For laboratory courses, we also discussed a new department goal to discuss the curriculum throughout the sequence of courses. This would include notebook usage and the amount of individual vs. group work that the students should do as they progress from course to course.
*Worked with the Math Department to encourage/pressure the District to allow offering algebra as non-credit as an option for students as other colleges in the state have done in response to 1705.
*Continued participation in equity focused Professional Development
*Recruitment of Faculty Tutoring Liaison-adjunct professor Dr. Jeremy Fisher

Success Rates in General Chemistry
General Chemistry is defined as the pathway of courses of Chemistry 152->200->201 that is part of the curriculum for most science majors: Biology, Chemistry, and Engineering (some programs only require Chem 200).
Graph 1-SEE ATTACHMENT

Chemistry 152: Preparation for General Chemistry
Graph 1 shows an equity gap for Latine students of -9% for Fall ‘24 and an equity gap of -13% for Sp ‘25.

Despite our best efforts, educational trends and legislation are making strides for lowering equity gaps difficult. As science educators, we would be remiss to not discuss the impacts of AB 705 from the perspective of science education. AB 705 removed Intermediate Algebra from our course offerings at community colleges. Mesa College phased out Math 96 and there are currently no sections being offered. Support Course Models “x” classes to refresh material is the model being implemented. Returning students (adult learners, veterans, single mothers) that may have for a multitude of reasons chosen to take Math 96 are not allowed the choice to take an algebra course.
The effect of AB 705 implementation has not been properly vetted State wide in terms of the effects on science success rates. Physics and chemistry are required courses for Biology and Engineering Majors (top majors) and these subjects rely on strong algebraic abilities. There is a fluency in mathematics knowledge required for science courses. Data shows that students' ability to successfully complete chemistry and physics courses is linked to their math levels. The important connection between math knowledge and science courses' success rates was not taken into account with the legislation.
The prerequisite for Chemistry 152 is Math 96 or M50. However, due to AB 705, most students are clearing the M50 level and can register for Chem 152 without actually being prepared with the algebra skills needed for the course. From data provided by IE, many students are taking Math 116, 104, or 119 concurrently with Chemistry 152. However, students may not have the algebra skills. Students can clear M50 with three years of high school math (IM 1, 2, and 3). It also means that a student can potentially take Chemistry 152 without having had math in high school senior year. Many students enrolling at Mesa are not

coming directly from high school. So, recency of math is undoubtedly an issue. Many may clear M50 without having any recent recollection of algebra.

We highly recommend that the District allow offering algebra as non-credit as an option for students as other colleges in the state have done in response to 1705.
Recently, University of California San Diego reported recently that one out of eight students in UCSD entering class of 2025 had math skills below middle school level which is a thirty-fold increase over the last five years. AND YET ILLEGAL FOR COMMUNITY COLLEGES TO TEACH ALGEBRA!

Department Chair Dr. Budzynski requested data from Mesa College IE to see how students' grades in Chemistry correlated to their success in Chemistry 200. This would serve as a good data driven reflection. low). Success is the % of students who earn an A, B, or C. Completion is anyone who did not withdraw. Covid semesters of Sp 20, Fa 20, Sp 21 were eliminated, but data starts with students who took chem 200 in Fall 2019. It should also be noted that the first 3 weeks of Sp 22 were online because of a surge in covid cases, so that data is a bit skewed too (but is included here).

Grade in 152	Success Rate in 200
A	85%
B	67%
C	46%

Results were given for students who earned a D, F, or W in 152. Most of those students eventually repeated the 152 course (so there are duplicate students in the data). The D and F success % are 42% and 40% while the W is 51%. There are probably a few in there who managed to bypass the prerequisites requirement and go to 200 without passing 152, as that does happen sometimes.

The second part of that study is success in 200 based on how long ago they took 152. No surprises there either:

1 term	76%
2 or 3 terms	67%
4 - 6 terms	52%
7 - 15 terms	53%

FYI, it says it in the reports below, but this is only for Fall and Spring semesters, and only for students who took 152 at Mesa college. If they took it elsewhere, or did not take 152, they were not included in the cohort.

The second report is on grade distribution in 152 for those same semesters. There are not any huge trends in the % of each grade, but there does seem to be a slight increase in % of F grades over time, and a slight decrease in % of C grades, although neither is dramatic.

These results were distributed to Chem 152 and Chem 200 instructors and discussed at the Curriculum Work Group. This discussion will continue next semester.

Chemistry 200 General Chemistry I
Graph 2 shows success rate data disaggregated for Latine and White students for Chemistry 200 shows success rates for general chemistry- 77% (F ‘24) and 73% (Sp ‘25).
The equity gaps between Latine students and White students varies from each semester. However, Fall ‘24 and Sp ‘25 show gaps of -19 & -7.

However, there is a positive trend. As discussed in the last program review, Latine students' success rates were most affected by the pandemic with a low point in Sp ‘22. Latine students' success rates have improved since then and match pre-pandemic success rates. There is still a significant equity gap when compared to white students.

Graph 2-SEE ATTACHMENT

General Chemistry I Accelerated and Development of New Course (Chem 200E)
Chem 200 is General Chemistry I Lecture (3 units) with a Chem 200L corequisite (2 unit lab). Intermediate algebra and Chem 152/L prerequisite (3 + 1 = 4 units) or pass a Challenge Exam are the prerequisites. Chem 200 is required for many STEM

majors: Engineering, Chemistry, Biology, and Physics.

As part of the E3 HSI STEM Grant, we have been offering Accelerated Chem 200 since Fall '22. This course has a regular Chem 200 section (3 units) offered with a required Chem 20 section (0.5 units) as a supplemental course. The purpose of this is to allow students with high math levels to skip the prerequisite Chem 152 course and go directly to Chem 200. The Chem 20 course covers the most essential background Chemistry 152 topics students need to be successful in Chem 200. Because there are not enough Accelerated Chem 200 students in a given semester to fill an entire section, traditional non-accelerated students who had met the Chem 152 prerequisite were also enrolled in these sections. These students also participated in Chem 20, except during the first semester, Fa '22, when only Accelerated students took Chem 20.
Students with higher math levels (Completion of Calculus I or above) were chosen because previous data showed Chem 152 and 200 students with this math level had very high success rates. General Chemistry courses are mathematical in nature so it was hypothesized that these students would be most likely to succeed in a faster paced course. These accelerated students would save 3.5 units since they would be skipping Chem 152 and 152L (four units total). This is especially important for high unit majors such as Engineering.

In July 2024, a study was conducted by Mesa researcher Adriana Caetano on the 78 total Accelerated Chem 200 students enrolled during the first four semesters offered from Fa22 through Sp24. The main take away from the study is that Accelerated Chem 200 has been a success. The accelerated students had a 79% success rate, and a 3.09 GPA compared to a 75% success rate and 2.79 GPA for non-accelerated students in the same sections. During this period, the overall success rate for all sections of Chem 200 was also 75%.
In Spring 2025, there were 18 accelerated students out of a class of 48. For the accelerated students there was an 83.3 % success rate vs. 66.7% success rate in the non-accelerated students.

Thanks to Dr. Budzynski was inspired to develop this pilot and curriculum and taught the course for many semesters, Dr. Fusco, and Dr. Schafer who is currently the lead on the course. Because of the difficulty in enrolling students and the desire to be easier for students to enroll, Dr. Budzynski has developed a new course General Chemistry I Accelerated (Chem 200E). Dr. Gustin helped input the course into the system. In order to shepherd through the difficult process. Dr. Budzynski and Dr. Gustin met with the Curriculum Committee Chair, District Curriculum Dean, Articulation Officer, and Mesa College Curriculum writer. The proposal is in CurriQunet and has made it to CRC level! However, all program impacts are a lot of work and requires the help of Curriculum Writer Chris Kinney. It may prove to be very difficult.

Chemistry 201
The data from Chemistry 201 is shown in Graph 3. In Fall ‘24 there was a -17 equity gap between White and Latine students, but Latine students are above 70% and fairly close to the college overall success rate. In Spring ‘25, there was not a significant equity gap -4%. Both groups significantly exceeded the college success rates.
Graph 3-SEE ATTACHMENT

Organic Chemistry-Chemistry 231
Organic Chemistry is a course that is taken by most biology and all chemistry majors. Graph 4 shows solid success rates for overall success rates, success rates for white and Latine students. In Fall ‘24, the success rate was 75% overall with a -27% equity gap for Latine students. In Spring ‘25, the overall success rate was 81% with a -17% gap.
The organic chemistry program appears to be strengthening overall in the last four semesters. This is in part due to expanding our team to two devoted Organic Chemistry professors (Saidane & Chang). Our new tenure track professor, Dr. Chang has certainly been an excellent addition to our program.
The department is looking forward to having our new tenure track faculty member join the department and the organic program.
The need for new instrumentation and computers is important for this class (see goals)

Graph 4-SEE ATTACHMENT

Chemistry 233
The success rate for Chem 233 for Fall 2024 is 75% and for Spring ‘25 was 87% compared to 77% in average of Sp 18, F 18, Sp 19, & F19. It appears that last year, the success rates are improving in this class. There are not enough enrollments ~20 each semester to disaggregate the data. The department is looking forward to having our new tenure track faculty member join the

department and the organic program. The need for new instrumentation and computers is important for this class (see goals)

Success Rates in Allied Health Track
The following Table 7 shows a comparison of the Allied Health Courses:

TABLE 7-SEE ATTACHMENT

All of the courses in our Allied Health Track exceed the overall college success rates in Fall '24 and Spring '25.
Chemistry 100 has an equity gap of -22% in both Fall '24 and Spring '25. Disaggregation of the remainder of the courses is not available due to lack of number of students.

General Education Course-Chem 111
This course had success rates of Fall 24 (75%) and Spring 25 (65%) which were inconsistent from the average success rate of 83% in Sp18, F18, Sp19, F19. This course is a great course to promote sustainability. Please see the Sustainability section of this document.
Spring '25 is an anomaly, but the main issue from the faculty is that attendance issues is the reason. Changes were made to the curriculum to encourage consistent attendance.

Laboratory Courses
Chemistry courses have co-requisites that provide hands-on and active learning to supplement the lecture. Chemistry lab provides a way of visualizing abstract concepts in a physical way.
In addition, students are encouraged to discuss their data as a class. In appropriate cases, they work in small groups. Laboratory is a fantastic way to foster camaraderie among students and professors. Our success rates in all laboratory courses exceed college success rates (Table 8).
Table 8: Success Rates in Laboratory Courses-SEE ATTACHMENT

The laboratory courses show consistently high success rates.
Chemistry 251-Analytical Chemistry
This course is an important course for chemistry majors as it is required for transfer preparation for SDSU. Chemistry 251 was offered for the first time in Spring 2024 since Spring 2020. The success rates are shown in Table 9. The data cannot be disaggregated due to small number of enrollments.
Dr. Chadeghani with the mentoring of Dr. Budzynski allowed for the revival of this course. There is a learning curve in teaching this course since it is heavy on instrumentation. The success rates can be analyzed further as we can continue to offer the course each Spring.
The need for new instrumentation and computers is important for this class (see goals

Need for New Faculty-
Enrollment is significantly rising. Our department prides itself on excellence in managing enrollment. Our fill rates exceeded 102+% in Fall 2025. We believe that our department's commitment to excellence in a supportive and positive learning environment draws students to Mesa College Chemistry.
Currently, there are 9 full time faculty members and 20 adjuncts in the department. Adjunct FTEF is 11.4 for Fall 2025 which is 54% of our total FTEF. There are four Instructional Laboratory Technicians (ILT). We have just this month (November) returned to full staffing in the ILT team.
Last few semesters FTEF, fill rate, and productivity

Last few semesters FTEF, fill rate, and productivity

Semester	FTEF	Fill Rate	Productivity
F25	21.167	103%	15.66
SP25	20.367	102%	15.58
F24	19.97	101%	15.27

General Chemistry is driving the high fill rates. This semester we have 152 (106%), 200 (107%), and 201 (101%). Similar high

fills for those classes in S25 well, and all three courses were over 100% in F24. This semester, we added an additional section of 200. Chem 152L is limited by lab room space, and Chem 200L and 201L are reaching that limit as well. FTEF planned for S26: 23.034. The need for additional faculty is present. Currently, we recently completed interviews to replace Dr. Gergens by hiring a full- time tenure track person for the organic program. Dr. Saidane retired after Spring 2025 and this position is open. We need a full- time professor to replace our retirement.

We have been hiring new adjuncts every semester, but some leave after taking full time jobs and others have scheduling conflicts. We would like to increase our FTEF even more, especially in General Chemistry, but finding adjuncts has become more difficult. We were recently granted more FTEF for Spring 26, but are scrambling to find instructors. There was enough FTEF for Spring 26 to easily fill two new contract spots without impacting current adjuncts. We are bringing in four new adjuncts to fill the gap, in addition to the one new contract, who will be starting in Spring 26.

The goal of the Chemistry Department has been to provide equitable quality education in a student centered and positive learning environment. To this end, the Department has taken leadership roles and participated in many events and programs to help students feel welcomed and supported. We have pivoted in so many ways and always worked as a team to provide quality learning for our students. These transitions required constant re-writing and adjusting of course materials and countless hours of work from our faculty. It is our belief that our department needs one additional full time faculty member to join our team of educators. We need an equity minded General Chemistry instructor with a strong analytical and thermodynamics background that leans towards teaching physics/engineering students. This is for reasons that will be explained in this narrative. In addition, we would like a faculty member that has an interest in forming partnerships with outside institutions and bringing research collaborations with four year colleges and universities.
The Chairs and Senior faculty of the Chemistry Department are excellent new faculty mentors. We assign each new faculty a mentor who works with them throughout their tenure process. Additionally, the department works to maintain a supportive, nurturing space for all department faculty. Our recently hired faculty are quickly integrated into the department activities and comradery. This requires regular meetings, as well as constant office/hallway discussion of everything from activity organization, to teaching techniques, to course content and pacing. It is a constant and regular part of our days for new, as well as senior faculty. It is what makes our department run so well and how we can easily integrate new contract faculty members into the mix. We are requesting one more full time faculty member and our data shows that we are able to justify this request. As this program review discussed above, the General Chemistry track, in particular Chem 152, is most impacted by AB 705/1705, and the other educational policies. Chemistry 152 and Chem 200 are considered the gateway courses to STEM because they are required for other majors such as Biology and Engineering. Our department has worked tirelessly to help students through the supportive student-facing interventions described in the excellence section below. This includes participation in Path to Stem Success, and the five-year HSI E-3 Grant projects.

Our Department is very active on campus-wide committees including PAC, Academic Senate, Enrollment Management, Safety, and Curriculum Committees. We know the importance of strong relationships with Peer Mentoring and Tutoring to better serve our students since Chemistry is in high demand in these areas.

There are three major projects that require additional full time contract faculty.
One is Chemistry 200E-General Chemistry I- Accelerated course which will eliminate barriers to General Chemistry and support timely completion of educational goals. This project focuses on improving instructional effectiveness with a gateway STEM course. This is the accelerated chemistry course described in a previous section, that we are launching as a stand alone course, instead of a linked learning community course. This is a data driven project that shows success in general chemistry if the student has completed calculus (Math 150 or Math 121). Chem 200E has the potential to save many students 3.5 units. There is a contract faculty member leading these efforts who is also department chair, but this is a many year long process that needs a dedicated full time general chemistry professor.

The second is adjusting curriculum to adjust for AB 705/1705. Chemistry requires specific math skills upon entering our General Chemistry or Allied Health pathways. Because of changes in math prerequisites, our department needs to adjust curriculum and work closely with the math department to continue to provide quality chemistry education. This will require additional full time faculty members in our department. Department Chairs have worked with Math Chairs and Dean to understand the full impact of the the legislation on STEM majors and courses. This goes hand in hand with the dramatic reduction in entry level math skills that colleges across the region are seeing and studying, in part due to pandemic learning loss and changes in high school instruction. We have experienced these dramatic drops in math skills simultaneously with the

elimination of pre-transfer level math courses. This is hitting STEM major General Chemistry courses particularly hard. This conversation is occurring through chemistry departments' heavy involvement in the HSI Curriculum Work Group through the E-3 HSI Grant.

The third project is the continual evaluation of laboratory instrumentation for upkeep or replacement. Our Math and Science Building will be 12 years old this January, and that means most of our instruments are that same age. Chemistry lab instrumentation is digital similar to computers. Many times the instruments need actual computers to run. A 12 year old computer is bound to develop issues, and that is what is happening to much of our instrumentation. Additionally, instruments that age are often no longer supported for repair by manufacturers. We need to start replacing these instruments, some small and less expensive and some large and very expensive. Our ILTs can help with this, but it takes instructors teaching the courses to evaluate the instruments and make those decisions. This is a very time consuming process, sometimes involving evaluating different models or manufacturers instruments. For example, in our Chem 201L lab course we will soon be evaluating a replacement instrument used to monitor pH and other variables in experiments. We received a sample of this instrument, and will need to test its functionality for our courses. We need additional contract faculty to help with this project which will keep our labs up to date for students.

Program Involvement: Department and College

In the academic year of Fall 2024-Spring 2025, the Department has put all its efforts to provide as much support as possible to students in numerous ways. Our department is extremely active in participatory governance, campus wide committees, and the HSI Equity, Excellence, and Exito (E-3) Grant. We support high quality and culturally relevant curriculum as part of every day teaching. Many of our contract faculty members support Honors Contracts that allow students to make relevant connections to important research.

Dr. Fusco has led the development and expansion of zero cost online homework for Chemistry 200. Dr Chadeghani has worked on developing the online homework system for Chem 200.

Ms. Danica Moore has been the Professional Development Lead for the grant. She recruited 30 faculty in the Math and Natural Sciences faculty to participate in the STEM Faculty Conference in June '25. Dr. Fusco was one of the faculty leads. Dr. Chang and Dr. Chadegani along with two adjuncts from the Chemistry department participated in this important equity minded program.

Ms. Danica Moore is serving as Faculty Chair of the Professional Advancement Committee (PAC).

Dr. Gustin is the lead on the Curriculum Work Group (CWG) HSI Equity, Excellence, and Equity Grant. The CWG had six Chemistry faculty participate last year (Dr. Budzynski, Ms. Moore, Dr. Fusco, Dr. Chang, Dr. Chadeghani, and Dr. Sardo). This semester Dr. Shafer has joined the group. This is interdisciplinary work focusing on the elimination of barriers and to provide support for students entering Mesa College. We are collaborating heavily with the faculty from physics, math, engineering, and biology. Last year the group focused on efforts to amend AB 1705 and develop Chem 200E (see below).

Dr. Sardo has been a strong senator at the Academic Senate. Ms Moore attends as PAC chair executive. They have voiced our concerns over safety issues at the college that we feel needed to be discussed and fixed. Dr. Sardo is on the campus Safety Committee and is CERT trained. She Sardo has been in communication with Dean Carmichael and worked with her to discuss building specifics. However, there has been a lot of frustration at the lack of support from campus wide safety committees that have not been convened. The chemistry department is committed to safety training that can help to better prepare for earthquakes, emergencies, and school shootings. We hope that the college continues to improve in its commitment to keep the campus safe, but without commitment on part of the wider college, these efforts seem futile.

Dr. Budzynski and Dr. Gustin worked with Mathematics Chairs Juan Bernal and Ken Kuniyuki to bring awareness and legislative changes to an extremely inequitable law, AB 1705. The chemistry department adamantly opposes AB 1705. AB 1705 seeks to further remove choices for students to select the appropriate math journeys that are critical to student success in chemistry. Data was referenced above that shows that student fluency in math is critical to success in our program. We strongly oppose forcing ALL entering community college STEM students into Calculus. Students with two or three years of high school math should have the choice to take a two course sequence in precalculus/trigonometry. Returning students, in

particular Veterans that have been out of school for a while, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to take Pre-Calculus. The double standard of not allowing community college students to take precalculus is inequitable.

In Spring of 2025, Dr. Budzynski and Dr. Gustin, along with Math Chairs and Vincent Williams (student Veteran), flew to Sacramento to attend an AB 1705 Oversight Hearing. We paid for this trip out of pocket because of our belief that the law is inequitable. It was an intense day where we watched Mr. Bernal (Math Chair) and Vincent Williams address Irwin (legislator) and the RP Group. The rest of the group made public comments. It was very emotional. The outcome was a pause on implementation of the precalculus and trigonometry restrictions. The fight isn't over. Algebra skills relevant to our courses need to be available in courses at the college. Repeal 1705!

The department would like to express how upsetting it has been to have our expertise dismissed by the State Chancellor's Office & Legislators. Our department does not feel supported. We don't believe that we work in a healthy vibrant professional environment where we are valued as employees, science educators, and scientists. Our department works hard to be there for students. Students have choices of where they want to study chemistry. Our high fill rates, success rates, and evaluations explain why they chose to be at San Diego Mesa College for their chemistry. This legislation directly impacts our ability to do our jobs. Bring back algebra to community colleges!

Highlights our department's commitment to equity and excellence.
*Timely Assessment of Student/Course Learning Outcomes (CLO)
Dr. Gustin is the lead faculty on CLO assessments The chemistry department has done an excellent job on CLO assessment. It is on track to assess all of our courses. The department is using this information to make data driven requests.

*Development of Chemistry 200E
Dr. Budzynski has developed Chem 200E-General Chemistry I Accelerated. I inputted the course into the system and am helping shepherd it through the difficult process. We met with the Curriculum Committee Chair, District Curriculum Dean, Articulation Officer, and Mesa College Curriculum writer. The proposal is in CurriQunet and has made it to CRC level! The program impacts are numerous! It may prove to be very difficult.

* Work-based Learning Liaison
Dr. Chang provides support for faculty that like to include WBL elements in their classes. In the Chemistry department, she has provided support for Professor Bryce Ackermann in his organization of a UCSD lab tour for his lab students. She also provided guidance for Professor Jeffery Saikali in his engineering course on how to organize a scientist panel.

*STEM Faculty Conference participation (see above)

*Peer Mentoring Leads Dr. Chang and Dr. Fusco have been actively involved in the Peer Mentoring Program.
In Spring 2025, we had 9 Peer Mentors (4 for Chem 152, 2 for Chem 200, 2 for Chem 201 and 1 for Chem 231/233). For Fall 2025 we have 6 Peer Mentors (2 for 152, 1 for 200, 1 for 200/201, 1 for 201 and 1 for organic chem).

We had nine Peer Mentors in Spring 2025 and five in Fall 2024. This included Chem 152, 200, 201, 231, and 233. Participation of the students is very high with 99 students in Fall 2024 and 205 students in Spring 2025. Chemistry non-participants' success rate is 69% and course GPA 2.55. Peer Mentor participants that went more than 6-9 times had an 83% success rate and course GPA of 2.92 (Fall '24) and 85% and course GPA of 3.05 (Spring 2025). More than 10 times was 96% success and course GPA 3.33 in Fall '24 and 93% success rate and course GPA of 3.19 in Spring '25.

*Participation in Classroom Tutoring Program:
Chemistry 100 instructors (Ms. Moore) and Dr. Chadeghani (Chem 152) participated in mentoring classroom tutors. This is a great way of providing more support for students. During this timeframe, Classroom Tutoring (under MT2C) provided tutors that would work with students 3 hours a week. (See concerns below). But, we are not supported in this area. (See section below).

*Enrollment Management-
Chemistry took an active role in participating in campus efforts to complete and implement a three-year Strategic Enrollment

Summary and Reflection

Management Plan. Dr. Budzynski was co-chair of the Enrollment Management Committee for two years, and helped lead this campus-wide effort. Our department sees equity in the details especially in providing a reliable and managed schedule with minimal cancellations. Kudos to Dr. Budzynski with her acumen in building a schedule with high productivity and that is student centered.

*NFI Participation: Dr. Shafer has participated in NFI and brought her enthusiasm to our department.

*Classroom Redesign
Completed! The classroom redesign project led by Dr. Chadeghani and Dr. Fusco in MS 422 is done! Numerous sections of Chem 152, Chem 100, Chem 231, and Chem 233 are being offered in the room. It has been a success for some sections. Others have requested to be moved to the traditional classroom for various reasons. However, the instructors that enjoy the classroom are seeing great student engagement within the interactive classroom.

*ACS Chem Club: Dr. Chang continues to be the faculty advisor of the San Diego Mesa College ChemClub and active in the San Diego local American Chemical Society Section. This Fall '25, the club is occupied with several on-campus Green Chemistry events (The first one, Bioplastic-making rice paper, was completed in September), Encina Wastewater Pollution Control facility tour in November, and a poster presentation in the San Diego ACS National meeting in March.

*Tutoring Faculty Liaison: Dr. Jeremy Fisher is working closely with MT2C to interview and train chemistry tutors.

*Continue fighting against AB 1705 to repeal!

Sustainability
Our students show a strong interest in environmental issues and sustainability and our department has an environmentally focused curriculum in many courses. Our Chemistry 111/111L which discusses climate change, water and air pollution, and the disproportionate impact on communities of color. Many of our laboratory courses-Chem 200L and 201L- which serve our STEM majors of engineering and biology have laboratory analysis that is related to the environment. This is particularly focused on water pollution. There has also been an active effort on the part of our six Lab Coordinators to participate in Green Chemistry Lab Redesign to reduce chemical usage, and substitute more environmentally friendly chemicals into experiments where possible.

Chemistry Department Concerns Regarding Lack of Support for Institutionalizing Peer Mentoring

Over the last year, Mesa Chemistry Department has been actively involved in Peer Mentoring. The program has been an amazing asset in our equity efforts. Over the last year, 225 students have attended Peer Mentoring. It has become an important component of our General Chemistry & Organic Chemistry Program. It builds strong relationships for the students with the faculty. It allows the Peer Mentors to develop their communication skills.
We are concerned that this amazing program that is part of our department will end with the end of the grant in Spring 2026. The Peer Mentor Model works for us! As professors, we can encourage students to be Peer Mentors. This is always with an equity focus. Many times we try and recommend students that may have never seen themselves in a leadership role. The interview process is straightforward. Students receive training and then are hired fairly quickly. They can begin the next semester. They work closely with faculty. Students feel comfortable with them because they tend to be of similar age and shared experiences. They also will have just taken the class they are mentoring.

We had nine Peer Mentors in Spring 2025 and five in Fall 2024. This included Chem 152, 200, 201, 231, and 233. Participation of the students is very high with 99 students in Fall 2024 and 205 students in Spring 2025. Chemistry non-participants' success rate is 69% and course GPA 2.55. Peer Mentor participants that went more than 6-9 times had an 83% success rate and course GPA of 2.92 (Fall '24) and 85% and course GPA of 3.05 (Spring 2025). More than 10 times was 96% success and course GPA 3.33 in Fall '24 and 93% success rate and course GPA of 3.19 in Spring '25.

Our experiences with MT2C are not the same and we have concerns that have been voiced over the last five years in meetings and directly to the MT2C staff and leadership. Here is a summary of our experiences. Although we work with the staff at MT2C to interview and place students, the MT2C model for approaching our needs as a department is lacking.
The students have to take Education 100 before even applying and there is no guarantee of employment. ED 100 extends the time that students are hired.

Summary and Reflection

The tutors do not typically work closely with faculty although we do have a Faculty Liaison currently working with MT2C.

Classroom tutoring hours have been cut from 3 hours with students to 1 hour with students. Responses to requests for Classroom Tutors are slow. It is unclear if any will be processed in time for Spring 2026. There is a major disconnect between the needs of the department and how MT2C Tutoring is run as a department. Why is this being mentioned? Chemistry accounts for one of tutoring's largest demand subjects to be tutored. 80% of the tutoring requested from MT2C is from Chemistry and Math. Yet, our faculty and student needs are dismissed.
We are concerned that when Peer Mentoring ends that the Chemistry students will have little support from tutoring, yet we have a LARGE demand from students for tutoring.

Future Work & Goals for Chemistry Department

The Chemistry Department has numerous goals for the next academic year. Goals 10 and 11 are new and important.

Goal 1: Continued involvement and leadership in the HSI Equity, Excellence, and Exito Grant. Currently, five chemistry faculty are heavily involved in the grant. There have been obstacles this year with the uncertainty regarding funding. Dr. Fusco and Ms Moore did not participate in the grant this semester, but will return for the next semester. Dr. Gustin did participate this semester, but will not in the next. IN PROGRESS

Goal 2: Development of Chemistry 200E for Fall 2027. The course has been entered. Curriquent. Program Impacts are vast. Target deadline for May 2026. IN PROGRESS

Goal 3: Hire one faculty- one for General Chemistry. In light of impending retirements and enormous amounts of faculty participation in college, it is critical that we obtain a replacement for Dr. Saidane-IN PROGRESS

Goal 4: Create more student centered spaces: Under Dr. Chadegani, we are looking forward to redesigning a classroom to be a warm, inviting space for instructor and student interaction-Completed

Goal 5: Increase representation of African American students:
The goal of the department will be to seek ways to improve the numbers of African American students in General Chemistry and Organic Chemistry to at least match the 6% representation of the college. One approach is to work more closely with counseling. Recruiting and retaining African American students in STEM will require more community outreach with high schools and working closely with a counseling representative. The majority of students in chemistry classes are not chemistry majors, but instead are biology, engineering, and allied health majors. So increasing African American students' interest in these majors will increase their numbers in Chemistry classes. Actively recruiting for our Chemistry Club may also be a possible venue to support Black/African American students. -IN PROGRESS

Goal 6: Increase Work Based Learning Opportunities for students.
Dr. Chang is the Faculty Work Based Learning STEM Coordinator, we can provide more opportunities for students in the area of work based learning. -IN PROGRESS

Goal 7: Analyze Enrollment Trends and Latine Representation in Organic Chemistry
Survey Chemistry 201 students to learn more about their plans for Organic Chemistry. Are they transferring before taking this class? This will help us to determine enrollment trends and perhaps understand why the Latine representation is lower in that sequence. -Completed

Goal 8: Focus on Curriculum Alignment

Discuss topics in Chem 152-200-201. Also included in this discussion are laboratory classes and how we can standardize lab skills, notebook, and group vs. individual work.
Chem 100-130-160 with emphasis on key skills needed for allied health majors. -IN PROGRESS

Goal 9: Reclassification of Instructional Laboratory Technicians Payroll -Abandoned goal. Lack of strong relationships with ILT makes this difficult.

Summary and Reflection

Goal 10. Need for instrumentation: As mentioned above in the need for new faculty sections, our Math and Science Building will be 12 years old this January, and that means most of our instruments are that same age. Chemistry lab instrumentation is digital similar to computers. Many times the instruments need actual computers to run them. A 12 year-old computer is bound to develop issues, and that is what is happening to much of our instrumentation. Additionally, instruments that age are often no longer supported for repair by manufacturers, and when they are supported, repairs can be very expensive. Furthermore, the original computers running many of these instruments are running Windows 7, which the district needs deactivated. That means we need to purchase new software for some of these that is compatible with Windows 11. However, it makes no sense to spend several thousand dollars on software for an instrument that is past its general life expectancy. We need to start replacing these instruments, some small and less expensive and some large and very expensive.

The larger and more expensive instrumentation includes the following:
NMR, UV/VIS Spectrophotometer, Graphite Furnace AAS, Gas Chromatograph, and HPLC. These instruments are used by our sophomore level lab courses including Organic Chem (Chem 231L, 233L) and Analytical Chem (Chem 251). These types of instruments have prices in the tens of thousands of dollars each, so we understand they cannot all be replaced simultaneously. However, a plan needs to be developed to replace them over time. Additionally, we will continue to replace smaller digital instruments such as pH meters and probes and analytical balances. Even some of our refrigerators need to be replaced. The most logical funds for this replacement would be from the Prop HH bonds.

Goal 11: Need for additional laboratory space:
The chemistry department is very near maximum capacity for labs in the Chemistry Department, even with some very creative scheduling. We have seven teaching labs in the Math and Science Building for chemistry (where classes are scheduled), plus an instrumentation lab, and a computer lab used mainly for advanced data analysis. The teaching labs are as follows (classes scheduled in parentheses): MS 401 (Chem 152L), MS 403 (Chem 201L), MS 404 (Chem 200L), MS 407 (Chem 231L, 233L, 251), MS 408 (Chem 200L), MS 412 (Chem 100L, 111L), MS 414 (Chem 103, 130L). Note, room 407 and 414 are organic chemistry labs, configured for 18 students and including several fume hoods. The other teaching labs are similar to each other in setup (but not necessarily equipment) and each holds 24 students.

Of these rooms, 401 is the most over scheduled; we are currently running 16 three-hour Chem 152L sections in that room. It has labs running back-to-back (10 min between sections) from 8am - 5:20 pm Mon through Th; from 8am - 2:20 pm Fri, and from 7pm-10pm two evenings a week. The only non-scheduled times are 5:20-10 pm two days a week. That means we could schedule at most two more three-hour evening sections. This semester, the Chem 152L course is 100% full. This is the laboratory portion of the gateway course for many STEM majors. Chem 152 serves as the prerequisite for Chem 200/L as well as Biol 210a. We need to expand this course to relieve a STEM majors bottle neck. However, we are very out of space in this room, and other rooms as well. And, if we do try and squeeze a few sections into other spaces, this impacts our ILTs who would then need to set up that week's experiment in two different rooms. It may also impact equipment if something required for Chem 152L is not available in another lab room.

The two lab rooms for 200L are also running out of space. These sections run 6 hours per week each. We currently have 10 sections scheduled. The only times left open are the MW 8-11am spots (both rooms), the all day Friday spot (one room open) and additional evening spots. This course is over 100% full as well, so next year we will try to open additional sections in those MW 8am spots. An additional evening class is also possible, but those times are generally not favored by many students, and the same is true for all day (6 hour) Friday labs.

The schedule for Chem 201L may need to be reworked to try and squeeze more sections into room 403, but it is also near max capacity. Room 407 which is where our 231L, 233L, and 251 labs are taught is very impacted, and it would be nearly impossible to add more sections there. Those courses are full or nearly full for Spring 26 already. Part of the problem in that space is with three different preps, our ILTs are also squeezed for space to fit the chemicals and equipment needed for weekly experiments. One way to ease this would be to add an additional fume hood in the adjacent the Instrument Lab (MS 405). This would help alleviate some of the space issues for ILT experimental setups we have in 407. It would also be safer to have more space for these chemicals.

One room where we are not as impacted is room 414 (103 and 130L). This lab room is designed to accommodate 18 students in its current configuration, making it not suitable to expand 152L into the space (which has a cap of 24). One plan that should be considered is to try and offer some sections of 231L in this room. However, this room is not near the instrument lab. So

additional instruments would need to be purchased to do that. Additionally, another hood or two would need to be added to this room to safely run 231L. This is a costly but potentially FTES generating proposal. It would also help more students finish their degrees at Mesa and in a timelier manner since Chem 231L, 233L and 251 are capstone courses for many majors.

In general, we have very little time (10 min) between sections in most of our lab rooms. This can be difficult on ILTs to get in these rooms and check on supplies, refill bottles, empty hazardous waste, etc. Our lab spaces are at or near capacity. This will impact expansion to accommodate more students, which our current fill rates are pointing towards.

One might ask why this wasn't planned for when our building opened 12 years ago. The answer is that we tried. At that time (during the planning stage of the building, so roughly 15 years ago) the department was told by the district that we could not plan for more than 10% growth in the building. The idea at the time was that Miramar College would be the place for larger expansion. The building's planning committee advocated strongly for more lab space, but we were told no.

So overall, the chemistry department needs additional lab space to accommodate student demand. This would take several years or more. More immediately, we could add a bit more capacity in our current space with some modifications such as setting up MS 414 to handle Chem 231L and adding another hood to the instrument lab.

Review Outcomes Report. Review the unit's outcomes assessment process for 2024 - 2025. Discuss connections to unit goals/action plans/resource requests.
Student/Course Learning Outcomes (CLO/SLO) Update for Fall 2024/Spring 2025 & CLO Action Plan

The faculty worked hard assessing 75% of the 84 Course Learning Outcomes for last year's cycle and the Department will complete 100% of the CLO assessments by March 2026.

Chairs worked on ensuring that all syllabi in the department contained the correct student learning outcomes. This project is VERY time consuming and labor intensive. This semester showed that some of the syllabi did not have the correct prerequisites.

The department assessed all of our courses for the following Course Learning Outcomes:
Lecture Courses:
CLO #1: Atoms and Compounds
Use current theories to describe atoms and compounds.

CLO #2: Structure and Properties
Describe bonding, name using standard nomenclature rules, and/or write structures of chemical compounds. Correlate the relationships between structure and properties.

Laboratory Courses:
CLO #2. Observation and Data: Following the experimental procedure using proper safety and chemical disposal, record detailed observations and data so that one can troubleshoot or detect errors.
CLO #3. Calculations: Perform calculations using the appropriate equations and units.

Faculty met during Fall 2025 to discuss the assessment results to review the results and determine ways of improving. Most of our lecture courses met a threshold of 70% or above on the assessment and all laboratory courses meet a 3/5 on the departmental rubric for laboratory. Even if courses did meet the assessment targets, we discussed in what ways we can further support students to improve. Faculty feel strongly that AB 705 and the loss of our prerequisite algebra courses is deeply affecting us. Algebraic skills are low for students.

How will our department support students?
Student/Course Learning Outcomes Action Plan

*Developed Chemistry 200E-General Chemistry I Accelerated (see section above).

*Continued our support for Peer Mentoring by participating in peer mentor recruitment and guidance.

Summary and Reflection

*Increased communications and resources for Chem 152 faculty.

*Made pathway changes and informed counseling so they can better guide students. This included a detailed document to the counseling department from Chairs that students entering into Chem 152 should take a math course before starting in Chem 152. This is data driven (see data).

*For laboratory courses, we also discussed a new department goal to discuss the curriculum throughout the sequence of courses. This would include notebook usage and the amount of individual vs. group work that the students should do as they progress from course to course.

*Worked with the Math Department to encourage/pressure the district to allow offering algebra as non-credit as an option for students as other colleges in the state have done in response to 1705.

*Continued participation in equity focused Professional Development

*Recruitment of Faculty Tutoring Liaison-adjunct professor Dr. Jeremy Fisher

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 4.
The San Diego Mesa College Chemistry Department continues to provide high quality instruction. Our faculty give 100% to students and the college.
The college can support us in many ways. There is a need for the college to support our department with funds to properly maintain and replace our aging instrumentation. In addition, there can be an expansion of our program with a lab redesign that will require a commitment on the part of the college. This will require additional full-time faculty to replace our retirements.

In addition, AB 1705 has already affected our Chem 152 success rates and this is a gateway course to STEM for underserved groups. We encourage District to offer algebra as a non-credit option like other colleges in the State of California. Also, we are seriously concerned about losing Peer Mentoring as our tutoring model. Institutionalize Peer Mentoring!
Until these issues are properly addressed by Campus and District Leadership, there is a disconnect for our department and the College. Please see the above section in Program Review for the details.

YEAR 5 Updates (2026 - 2027)
Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 5.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 5.

Review Outcomes Report. Review the unit's outcomes assessment process for 2025 - 2026. Discuss connections to unit goals/action plans/resource requests.
Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 5.

Unit Goals, Action Plans, and Updates

Goal 1: Continued involvement and leadership in the HSI Equity, Excellence, and Exito Grant.

Unit Goal: Goal 1: Continued involvement and leadership in the HSI Equity, Excellence, and Exito Grant. Currently, five chemistry faculty are heavily involved in the grant. Dr. Fusco Hernandez is the PI, Dr. Paula Gustin is the faculty chair of the Curriculum Work Group, Dr. Budzynski is the chair of the Classroom Redesign Project. We intend on being active in STEM Curriculum Alignment Projects, Curriculum Maps, and AB 1705 discussions.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 1:** Use technology to improve communication and accessibility across campus. (✓)
- **Community - Objective 2:** Develop activities, spaces, and programs that support a sense of belonging with a focus on antiracism, historically minoritized groups, and inclusion. (✓)
- **Community - Objective 3:** Build a culture of communication that is evidence based, race conscious, institutionally focused, systemically aware, and equity advancing (✓)
- **Community - Objective 4:** Remove barriers to equitable participation by developing, incentivizing and creating structures for all employees to engage in and design professional learning (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Completion - Objective 4:** Support students' access to resources to mitigate the impact caused by technological and basic needs insecurity (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 2:** Expand partnerships with K-12 institutions to enhance program offerings and increase access for minoritized students. (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)

Unit Goals, Action Plans, and Updates

- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)
- **Stewardship - Objective 1:** In collaboration with students, develop a climate action plan aligned with state and city goals that includes a timeline to reduce Mesa College's carbon footprint, focuses on climate literacy and student action, and mitigates Mesa's impact on climate change (✓)
- **Stewardship - Objective 2:** Support processes and initiatives that prioritize environmental sustainability and reduce Mesa College's impact on climate change (✓)
- **Stewardship - Objective 3:** Increase student access and schedule efficiency by coordinating schedules among departments/disciplines (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)
- **Stewardship - Objective 5:** Increase campus understanding, communication of and transparency in budget and resource allocation (✓)
- **Stewardship - Objective 6:** Develop a proactive hiring plan that includes a review of advertising, screening, and interviewing with a goal of establishing a diverse and competent workforce that is reflective of the student population and the local community (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Curriculum Alignment Projects, Curriculum Maps, and AB 1705 discussions. **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Action Plan Update: Classroom Re-design Project-Completed! Curriculum Alignment Projects Continued discussions with Math, Biology, and Physics regarding the use of Excel for graphing, precision, data analysis, and statistics. Curriculum Maps-COMPLETED Completed project with Biology and given to Counseling. AB 1705 Discussions Dr. Budzynski and Dr. Gustin worked with Mathematics Chairs Juan Bernal and Ken Kuniyuki to bring awareness and legislative changes to an extremely inequitable law, AB 1705. The chemistry department adamantly opposes AB 1705. AB 1705 seeks to further remove choices for students to select the appropriate math journeys that are critical to student success in chemistry. Data was referenced above that shows that student fluency in math is critical to success in our program. We strongly oppose forcing ALL entering community college STEM students into Calculus. Students with two or three years of high school math should have the choice to take a two course sequence in precalculus/trigonometry. Returning students, in particular Veterans that have been out of school for a while, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to take Pre-Calculus. The double standard of not allowing community college students to take precalculus is inequitable. In Spring of 2025, Dr. Budzynski and Dr. Gustin, along with Math Chairs and Vincent Williams (student Veteran), flew to Sacramento to attend an AB 1705 Oversight Hearing. We paid for this trip out of pocket because of our belief that the law is inequitable. It was an intense day where we watched Mr. Bernal (Math Chair) and Vincent Williams address Irwin (legislator) and the RP Group. The rest of the group made public comments. It was very emotional. The outcome was a pause on implementation of the precalculus and trigonometry restrictions. The fight isn't over. Algebra skills relevant to our courses need to be available in courses at the college. Repeal 1705! **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track **Submission Date**: 12/01/2024

	Action Plan Update: In the academic year of Fall 2023-Spring 2024, the Department has put all its efforts to provide as much support as possible to students in numerous ways. Our department is extremely active in participatory governance, campus wide committees, and the HSI Equity, Excellence, and Exito (E-3) Grant. We support high quality and culturally relevant curriculum as part of every day teaching. Many of our contract faculty members support Honors Contracts that allow students to make relevant connections to important research. Dr. Fusco has led the development and expansion of zero cost online homework for Chemistry 152 and Chem 20. This time consuming endeavor has been very successful and been adopted by five other instructors. This was surveyed and it was given a 4.8/5.0 with 38/48 students responding. The students' comments were very positive regarding built in student support. Ms. Danica Moore has been the Professional Development Lead for the grant. She recruited 30 faculty in the Math and Natural Sciences faculty to participate in ESCALA in Spring 2024-December 2024. Dr. Fusco is one the ESCALA Table Lead on the program. Dr. Chang and Dr. Chadegani participated and two adjuncts from the Chemistry department participated in this important equity minded program. Dr. Gustin is the lead on the Curriculum Work Group HSI Equity, Excellence, and Equity Grant has six Chemistry full time faculty who have taken initiative in participating in the HSI Excellence, Equity, and Exito. This is interdisciplinary work focusing on the elimination of barriers and to provide support for students entering Mesa College. We are collaborating heavily with the faculty from physics, math, engineering, and biology. This year, our group helped Biology Chair Dr. Brahmbhatt finalize the Biology pathways and 2, 3, and 4 year plans that can help students. Dr. Budzynski and Dr. Gustin worked with Mathematics Chairs Juan Bernal and Ken Kuniyuki to bring awareness and legislative changes to an extremely unequitable law, AB 1705. The chemistry department adamantly opposes AB 1705. AB 1705 seeks to further remove choices for students to select the appropriate math journeys that are critical to student success in chemistry. Data was referenced above that shows that student fluency in math is critical to success in our program. We strongly oppose forcing ALL entering community college students into Calculus. Students with two or three years of high school math should have the choice to take a two course sequence in precalculus/trigonometry course. Returning students, in particular Veterans that are adult students, should have the choice to take a one semester Precalculus course. Community college students should have the same options as University of California, California State University, and California High Schools students who will be able to teach Pre-Calculus. The double standard of not allowing community college students to take a precalculus is inequitable. Summary of our advocacy against AB 1705: 1. Communicated via email John Hetts (Vice Chancellor of IE at State Chancellor Office) & Dr. Lowe's Office regarding our concerns over the data collection and the negative impacts of the law on science education. 2. We attended to the State Chancellor's/RP Group Webinars on Mar 7th (Spotlight on STEM Calculus 1: Impact of Preparatory Pathways on Completion) and March 4th (AB 1705 Equitable Placement, Support, and Completion STEM Validation of Practices) regarding the validation of the prerequisites for STEM

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Calculus. We analyzed the RP Group study (Preparatory Pathways and STEM Calculus Completion: Implications of the AB 1705 Standards). Because of our teams' expertise in statistics and science, we have concluded that the statistical sampling and methodology used by the RP Group study (Preparatory Pathways and STEM Calculus Completion: Implications of the AB 1705 Standards) is invalid. It needs to be retracted and independent groups should audit their work. We believe that RP Group should be defunded as they have abused their power in a taxpayer institution. 3. Mr. Bernal, Dr. Gustin, Dr. Budzynski, and Student Leaders addressed the San Diego Community College Board of Trustees stating our opposition to the legislation. 4. Mesa Chemistry Department supported an OpEd article for SD Union Tribune written by Mathematics faculty. 5. We developed partnerships with City College faculty, Grossmont College, and Southwestern College. 6. We met with Chancellor Smith, Vice Chancellor of Instruction Susan Topham, and Dean of Instructional Services Shelly Hess. 7. Dr. Budzynski and I and Juan Bernal and ASG Student Leaders met with Assemblyman Christopher Ward. We met with Tasha Boerner. There were a total of 5 assembly representatives that were visited. 8. Dr. Lowe met with Dr. Budzynski and Ken Kuniyuki (Math). 9. We met with the UC San Diego Mathematics Department who concurred with our assessment of the RP Group's Data. 10. Dr. Budzynski, Ms. Danica Moore, Juan Bernal, and Paula Gustin addressed the Board of Governors. 11. Assemblyman Ward contacted us to meet with his State Legislator underwriter to discuss changes to the legislation. The department would like to express how upsetting it has been to have our expertise dismissed by the State Chancellor's Office & Legislators. Our department does not feel supported. We don't believe that we work in a healthy vibrant professional environment where we are valued as employees, science educators, and scientists. Our department works hard to be there for students. Students have choices of where they want to study chemistry. Our high fill rates, rate of my professor, and evaluations explain why they chose to be at San Diego Mesa College for their chemistry. This legislation directly impacts our ability to do our jobs. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track
Action Plan Status: Active	**Submission Date**: 01/29/2024 **Action Plan Update**: Active

Unit Goals, Action Plans, and Updates

Action Plans	Updates
Action Plan: Path to STEM Success Day & Noche de La Familia **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Update Year**: 2023 - 2024 **Action Plan Progress**: Completed

Goal 2: Analyze data from the Acceleration Chemistry 200 Project in the next Program Review Year

Unit Goal: Goal 2: Analyze data from the Acceleration Chemistry 200 Project in the next Program Review Year. General Chemistry faculty are working through the Interdisciplinary STEM Curriculum Writing Group, focusing on pathways for students to accelerate in the General Chemistry path for students with higher math levels. Next cycle there will be enough data to discuss the approach and begin institutionalizing this pathway.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2023 - 2024

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 2:** Expand partnerships with K-12 institutions to enhance program offerings and increase access for minoritized students. (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)

Unit Goals, Action Plans, and Updates

- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Work with IE to collect data **Action Plan Cycle:** 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025 **Action Plan Update**: Development of Chem 200E In July 2024, a study was conducted by Mesa researcher Adriana Caetano on the 78 total Accelerated Chem 200 students enrolled during the first four semesters offered from Fa22 through Sp24. The main take away from the study is that Accelerated Chem 200 has been a success. The accelerated students had a 79% success rate, and a 3.09 GPA compared to a 75% success rate and 2.79 GPA for non-accelerated students in the same sections. During this period, the overall success rate for all sections of Chem 200 was also 75%. In Spring 2025, there were 18 accelerated students out of a class of 48. For the accelerated students there was an 83.3 % success rate vs. 66.7% success rate in the non-accelerated students. Thanks to Dr. Budzynski was inspired to develop this pilot and curriculum and taught the course for many semesters, Dr. Fusco, and Dr. Schafer who is currently the lead on the course. Because of the difficulty in enrolling students and the desire to be easier for students to enroll, Dr. Budzynski has developed a new course General Chemistry I Accelerated (Chem 200E). Dr. Gustin helped input the course into the system. In order to shepherd through the difficult process. Dr. Budzynski and Dr. Gustin met with the Curriculum Committee Chair, District Curriculum Dean, Articulation Officer, and Mesa College Curriculum writer. The proposal is in CurriQunet and has made it to CRC level! However, all program impacts are a lot of work and requires the help of Curriculum Writer Chris Kinney. It may prove to be very difficult. Target date for offering the course is Fall 2027. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track **Submission Date**: 12/01/2024

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Action Plan Update: Chem 200 is General Chemistry I Lecture (3 units) with a Chem 200L coreq (2 unit lab). Chem 152/L prereq (3 + 1 = 4 units) or pass a Challenge Exam is the prerequisite. Chem 200 is required for many STEM majors: Chem, Biol, Phys, Enge, and Kinesiology. As part of the E3 HSI STEM Grant, we have been offering Accelerated Chem 200 since Fall 22. This course has a regular Chem 200 section (3 units) offered with a required Chem 20 section (0.5 units) as a supplemental course. The purpose of this is to allow students with high math levels to skip the prerequisite Chem 152 course and go directly to Chem 200. The Chem 20 course covers the most essential background chemistry 152 topics students need to be successful in Chem 200. Because there are not enough Accelerated Chem 200 students in a given semester to fill an entire section, traditional non-accelerated students who had met the Chem 152 prerequisite were also enrolled in these sections. These students also participated in Chem 20, except during the first semester, Fa 22, where only Accelerated students took Chem 20. Students with higher math levels (Math 121 or above) were chosen because previous data had shown these students to be most successful in Chem 152 and 200. Many of the topics in Chem 200 are mathematical in nature so it was hypothesized that these students would be most likely to succeed in a faster paced course. These accelerated students would save 3.5 units since they would be skipping Chem 152 and 152L (four units total). This is especially important for high unit majors such as Engineering. In July 2024, a study was conducted by Mesa researcher Adriana Caetano on the 78 total Accelerated Chem 200 students enrolled during the first four semesters offered from Fa22 through Sp24. The main take away from the study is that Accelerated Chem 200 has been a success. The accelerated students had a 79% success rate, and a 3.09 GPA compared to a 75% success rate and 2.79 GPA for non-accelerated students in the same sections. During this period, the overall success rate for all sections of Chem 200 was also 75%. The full report has been attached in Nuventive. This data was presented to the Curriculum Work Group Fall 2024. Thanks to Dr. Budzynski who began this curriculum and taught for many semesters and Dr. Fusco who is currently the lead on the course. **Update Year**: 2023 - 2024 **Action Plan Progress**: Completed
Action Plan Status: Active **Action Plan:** Present data to department and Curriculum Work Group **Action Plan Cycle:** 2023 - 2024, 2022 - 2023	**Submission Date**: 12/01/2024

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Action Plan Update: This data was presented to Curriculum Work Group Fall 2024. Only concern was from Biology Chair that was concerned about students being cleared into Biology 210A from accelerated project. This presents challenges for students because they will not have the chemistry knowledge. Solutions were discussed to advise students not to take Chem 200A with Biology 210A. **Update Year**: 2023 - 2024 **Action Plan Progress**: Completed

Goal 3: Hire one full time faculty- General Chemistry Faculty

Unit Goal: Goal 3: Hire one full time faculty- General Chemistry Faculty. In light of impending retirements and enormous amounts of faculty participation in college, it is critical that we hire one full time faculty for General Chemistry.

Update: One full time faculty-Analytical Chemistry has been hired for Spring 2024. One full time faculty still needed in General Chemistry.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2023 - 2024

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Completion - Objective 4:** Support students' access to resources to mitigate the impact caused by technological and basic needs insecurity (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 2:** Expand partnerships with K-12 institutions to enhance program offerings and increase access for minoritized students. (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)

Unit Goals, Action Plans, and Updates

- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)
- **Stewardship - Objective 1:** In collaboration with students, develop a climate action plan aligned with state and city goals that includes a timeline to reduce Mesa College's carbon footprint, focuses on climate literacy and student action, and mitigates Mesa's impact on climate change (✓)
- **Stewardship - Objective 2:** Support processes and initiatives that prioritize environmental sustainability and reduce Mesa College's impact on climate change (✓)
- **Stewardship - Objective 3:** Increase student access and schedule efficiency by coordinating schedules among departments/disciplines (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)
- **Stewardship - Objective 5:** Increase campus understanding, communication of and transparency in budget and resource allocation (✓)
- **Stewardship - Objective 6:** Develop a proactive hiring plan that includes a review of advertising, screening, and interviewing with a goal of establishing a diverse and competent workforce that is reflective of the student population and the local community (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Participate in hiring committee **Action Plan Cycle:** 2023 - 2024, 2022 - 2023	**Submission Date**: 12/01/2024 **Action Plan Update**: One full time tenure track professor was hired for General Chemistry-Julia Shaefer **Update Year**: 2024 - 2025 **Action Plan Progress**: Completed

Goal 4: Create more student-centered spaces

Unit Goal: Goal 4: Create more student-centered spaces: Under Dr. Budzynski’s leadership, we are looking forward to redesigning our computer lab area to be a warm, inviting space for instructor and student interaction. A permanent home for our Caffeine with Chemistry. We would love the vibe of the STEM Center or LOFT.

Unit Goals, Action Plans, and Updates

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 1:** Use technology to improve communication and accessibility across campus. (✓)
- **Community - Objective 2:** Develop activities, spaces, and programs that support a sense of belonging with a focus on antiracism, historically minoritized groups, and inclusion. (✓)
- **Community - Objective 3:** Build a culture of communication that is evidence based, race conscious, institutionally focused, systemically aware, and equity advancing (✓)
- **Community - Objective 4:** Remove barriers to equitable participation by developing, incentivizing and creating structures for all employees to engage in and design professional learning (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 4:** Support students' access to resources to mitigate the impact caused by technological and basic needs insecurity (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Participate in STEM classroom redesign. **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Action Plan Update: Completed! The classroom redesign project led by Dr. Chadeghani and Dr. Fusco in MS 422 is done! Numerous sections of Chem 152, Chem 100, Chem 231, and Chem 233 are being offered in the room. It has been a success for some sections. Others have requested to be moved to the traditional classroom for various reasons. However, the numerous instructors that enjoy the classroom are seeing great student engagement within the interactive classroom! **Update Year**: 2024 - 2025 **Action Plan Progress**: Completed **Submission Date**: 12/01/2024 **Action Plan Update**: Dr. Chadegani is leading the Classroom Redesign project for MS 422 to be completed by Fall 2025. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track
Action Plan Status: Active **Action Plan:** Seek funding for STEM LOFT on Fourth Floor **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	

Goal 5: Increase representation of African American students

Unit Goal: The goal of the department will be to seek ways to improve the numbers of African American students in General Chemistry and Organic Chemistry to at least match the 6% representation of the college. One approach is to work more closely with counseling. Recruiting and retaining African American students in STEM will require more community outreach with high schools and working closely with a counseling representative. Actively recruiting for our Chemistry Club may also be a possible venue to support Black/African American students.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping

Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 1:** Use technology to improve communication and accessibility across campus. (✓)
- **Community - Objective 2:** Develop activities, spaces, and programs that support a sense of belonging with a focus on antiracism, historically minoritized groups,

and inclusion. (✓)

- **Community - Objective 3:** Build a culture of communication that is evidence based, race conscious, institutionally focused, systemically aware, and equity advancing (✓)
- **Community - Objective 4:** Remove barriers to equitable participation by developing, incentivizing and creating structures for all employees to engage in and design professional learning (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Work with Chemistry Club to recruit African American Students **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025 **Action Plan Update**: Dr. Chang continues to be the faculty advisor of the San Diego Mesa College ChemClub and active in the San Diego local American Chemical Society Section. This Fall '25, the club is occupied with several on-campus Green Chemistry events (The first one, Bioplastic-making rice paper, was completed in September), Encina Wastewater Pollution Control facility tour in November, and a poster presentation in the San Diego ACS National meeting in March. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track
	Submission Date: 12/01/2024

Unit Goals, Action Plans, and Updates

Action Plans	Updates
	Action Plan Update: ACS Chem Club: Dr. Chang continues to be the faculty advisor of the San Diego Mesa College ChemClub and active in the San Diego local American Chemical Society Section. Besides organizing on campus events, the club participated in the ChemExpo last Fall, visited Pfizer Pharmaceutical Company in November 2023 and the General Atomic DIII-D National Fusion Facility in Spring 2024. This Fall, the club is occupied with several on-campus Green Chemistry events (The first one, Bioplastic-making rice paper, was completed in September), Encina Wastewater Pollution Control facility tour in November, and a poster presentation in the San Diego ACS National meeting in March. Currently, Dr. Chang is working with the Office of Student Affairs for the application of a professional travel grant that will help pay for several student's ACS National meeting registration. A student club is best to welcome diversity and equity. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track
Action Plan Status: Active **Action Plan:** Work with counseling/outreach **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 12/01/2024 **Action Plan Update**: Dr. Gustin reached out to counseling but not a lot of interest or place to begin this effort. **Update Year**: 2023 - 2024 **Action Plan Progress**: Barriers Encountered **Submission Date**: 12/01/2024 **Action Plan Update**: Dr. Gustin talked with counseling and student services but nothing told hold. **Update Year**: 2023 - 2024 **Action Plan Progress**: Barriers Encountered

Goal 6: Increase Work Based Learning Opportunities for students.

Unit Goal: Working with Ms. Moore (Faculty Work Based Learning STEM Coordinator), we can provide more opportunities for students in the area of work-based learning.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

Unit Goals, Action Plans, and Updates

- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 2:** Expand partnerships with K-12 institutions to enhance program offerings and increase access for minoritized students. (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)
- **Stewardship - Objective 1:** In collaboration with students, develop a climate action plan aligned with state and city goals that includes a timeline to reduce Mesa College's carbon footprint, focuses on climate literacy and student action, and mitigates Mesa's impact on climate change (✓)
- **Stewardship - Objective 2:** Support processes and initiatives that prioritize environmental sustainability and reduce Mesa College's impact on climate change (✓)
- **Stewardship - Objective 3:** Increase student access and schedule efficiency by coordinating schedules among departments/disciplines (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)
- **Stewardship - Objective 5:** Increase campus understanding, communication of and transparency in budget and resource allocation (✓)
- **Stewardship - Objective 6:** Develop a proactive hiring plan that includes a review of advertising, screening, and interviewing with a goal of establishing a diverse and competent workforce that is reflective of the student population and the local community (✓)

Unit Goals, Action Plans, and Updates

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Regular meetings with our STEM Liaison **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	
Action Plan Status: Active **Action Plan:** Communication flow to department from Work Based Learning **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025 **Action Plan Update**: Dr. Chang is our department's Work-based Learning Liaison Dr. Chang provides support for faculty that like to include WBL elements in their classes. In the Chemistry department, she has provided support for Professor Bryce Ackermann in his organization of a UCSD lab tour for his lab students. She also provided guidance for Professor Jeffery Saikali in his engineering course on how to organize a scientist panel. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track

Goal 7: Analyze Enrollment Trends and Latinx Representation in Organic Chemistry

Unit Goal: Goal 7: Analyze Enrollment Trends and Latinx Representation in Organic Chemistry
Survey Chemistry 201 students to learn more about their plans for Organic Chemistry. Are they transferring before taking this class? This will help us to determine enrollment trends and perhaps understand why the Latinx representation is lower in that sequence.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 2:** Expand partnerships with K-12 institutions to enhance program offerings and increase access for minoritized students. (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare

students for future careers (✓)

- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Scholarship - Objective 5:** Reduce costs associated with instructional materials to support the elimination of equity gaps (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** Write a survey **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 11/29/2025 **Action Plan Update**: Over the last year, the percentage of Latine students in our organic chemistry program has increased dramatically. So, this project is one that is still being monitored. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track
Action Plan Status: Active **Action Plan:** Collect data & report out to department **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	

Unit Goals, Action Plans, and Updates

Goal 8: Focus on Curriculum

Unit Goal: Discuss the curriculum in sequences of courses to ensure proper leveling and cohesiveness.
Discuss topics in Chem 152-200-201. Also included in this discussion are laboratory classes and how we can standardize lab skills, notebook, and group vs. individual work.
Chem 100-130-160 with emphasis on key skills needed for allied health majors

Goal Status: Active

Beginning Year: 2024 - 2025

Projected Completion Year: 2026 - 2027

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 2:** Develop activities, spaces, and programs that support a sense of belonging with a focus on antiracism, historically minoritized groups, and inclusion. (✓)
- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 2:** Develop cross - functional teams that support student success and include integrated career and transfer counseling. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 1:** Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)

Goal 9: Reclassification of Instructional Laboratory Technician Pay

Unit Goal: There is difficulty in recruiting and retaining ILT staff.

Goal Status: Active

Beginning Year: 2024 - 2025

Projected Completion Year: 2026 - 2027

Unit Goals, Action Plans, and Updates

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 4:** Remove barriers to equitable participation by developing, incentivizing and creating structures for all employees to engage in and design professional learning (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Stewardship - Objective 6:** Develop a proactive hiring plan that includes a review of advertising, screening, and interviewing with a goal of establishing a diverse and competent workforce that is reflective of the student population and the local community (✓)

Action Plans	Updates
Action Plan Status: Archived **Action Plan:** This is not a feasible goal at this time due to the difficulty in hiring and keeping ILT in the department. **Action Plan Cycle:** 2024 - 2025	

Need for Instrumentation

Unit Goal: Need for instrumentation: As mentioned above in the need for new faculty sections, our Math and Science Building will be 12 years old this January, and that means most of our instruments are that same age. Chemistry lab instrumentation is digital similar to computers. Many times, the instruments need actual computers to run them. A 12-year-old computer is bound to develop issues, and that is what is happening to much of our instrumentation. Additionally, instruments that age are often no longer supported for repair by manufacturers, and when they are supported, repairs can be very expensive. Furthermore, the original computers running many of these instruments are running Windows 7, which the district needs deactivated. That means we need to purchase new software for some of these that is compatible with Windows 11. However, it makes no sense to spend several thousand dollars on software for an instrument that is past its general life expectancy. We need to start replacing these instruments, some small and less expensive and some large and very expensive.

The larger and more expensive instrumentation includes the following:
NMR, UV/VIS Spectrophotometer, Graphite Furnace AAS, Gas Chromatograph, and HPLC. These instruments are used by our sophomore level lab courses including Organic Chem (Chem 231L, 233L) and Analytical Chem (Chem 251). These types of instruments have prices in the tens of thousands of dollars each, so we understand they cannot all be replaced simultaneously. However, a plan needs to be developed to replace them over time. Additionally, we will continue to replace smaller digital instruments such as pH meters and probes and analytical balances. Even some of our refrigerators need to be replaced. The most logical funds for this replacement would be from the Prop HH bonds.

Goal Status: Active

Beginning Year: 2025 - 2026

Unit Goals, Action Plans, and Updates

Projected Completion Year: 2029 - 2030

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 1:** Use technology to improve communication and accessibility across campus. (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Pathways and Partnerships - Objective 5:** Develop and implement technologies, including website redesign, that will make pathways information available to students so that they can effectively utilize this information in their educational and career planning (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Stewardship - Objective 2:** Support processes and initiatives that prioritize environmental sustainability and reduce Mesa College's impact on climate change (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)

Unit Goals, Action Plans, and Updates

Need for Additional Laboratory Space

Unit Goal: Need for additional laboratory space:
The chemistry department is very near maximum capacity for labs in the Chemistry Department, even with some very creative scheduling. We have seven teaching labs in the Math and Science Building for chemistry (where classes are scheduled), plus an instrumentation lab, and a computer lab used mainly for advanced data analysis. The teaching labs are as follows (classes scheduled in parentheses): MS 401 (Chem 152L), MS 403 (Chem 201L), MS 404 (Chem 200L), MS 407 (Chem 231L, 233L, 251), MS 408 (Chem 200L), MS 412 (Chem 100L, 111L), MS 414 (Chem 103, 130L). Note, room 407 and 414 are organic chemistry labs, configured for 18 students and including several fume hoods. The other teaching labs are similar to each other in setup (but not necessarily equipment) and each holds 24 students.

Of these rooms, 401 is the most over scheduled; we are currently running 16 three hour Chem 152L sections in that room. It has labs running back to back (10 min between sections) from 8am - 5:20 pm Mon through Th; from 8am - 2:20 pm Fri, and from 7pm-10pm two evenings a week. The only non-scheduled times are 5:20-10 pm two days a week. That means we could schedule at most two more three-hour evening sections. This semester, the Chem 152L course is 100% full. This is the laboratory portion of the gateway course for many STEM majors. Chem 152 serves as the prerequisite for Chem 200/L as well as Biol 210a. We need to expand this course to relieve a STEM majors bottle neck. However, we are very out of space in this room, and other rooms as well. And, if we do try and squeeze a few sections into other spaces, this impacts our ILTs who would then need to set up that week's experiment in two different rooms. It may also impact equipment if something required for Chem 152L is not available in another lab room.

The two lab rooms for 200L are also running out of space. These sections run 6 hours per week each. We currently have 10 sections scheduled. The only times left open are the MW 8-11am spots (both rooms), the all-day Friday spot (one room open) and additional evening spots. This course is over 100% full as well, so next year we will try to open additional sections in those MW 8am spots. An additional evening class is also possible, but those times are generally not favored by many students, and the same is true for all day (6 hour) Friday labs.

The schedule for Chem 201L may need to be reworked to try and squeeze more sections into room 403, but it is also near max capacity. Room 407 which is where our 231L, 233L, and 251 labs are taught is very impacted, and it would be nearly impossible to add more sections there. And those courses are full or nearly full for Spring 26 already. Part of the problem in that space is with three different preps, our ILTs are also squeezed for space to fit the chemicals and equipment needed for weekly experiments. One way to ease this would be to add an additional fume hood in the adjacent the Instrument Lab (MS 405). This would help alleviate some of the space issues for ILT experimental setups we have in 407. It would also be safer to have more space for these chemicals.

One room where we are not as impacted is room 414 (103 and 130L). This is designed to accommodate 18 students in its current configuration, making it not suitable to expand 152L into the space (which has a cap of 24). One plan that should be considered is to try and offer some sections of 231L in this room. However, this room is not near the instrument lab. So additional instruments would need to be purchased to do that. Additionally, another hood or two would need to be added to this room to safely run 231L. This is a costly but potentially FTES generating proposal. It would also help more students finish their degrees at Mesa and in a timelie manner since Chem 231L, 233L and 251 are capstone courses for many majors.

In general, we have very little time (10 min) between sections in most of our lab

Goal Status: Active

Beginning Year: 2025 - 2026

Projected Completion Year: 2029 - 2030

Unit Goals, Action Plans, and Updates

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 1:** Use technology to improve communication and accessibility across campus. (✓)
- **Community - Objective 2:** Develop activities, spaces, and programs that support a sense of belonging with a focus on antiracism, historically minoritized groups, and inclusion. (✓)
- **Community - Objective 5:** Increase opportunities to be an asset and resource to the external community (✓)
- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)
- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Pathways and Partnerships - Objective 3:** Increase community engagement, experiential learning, integrated career planning, and workforce training to prepare students for future careers (✓)
- **Pathways and Partnerships - Objective 4:** Expand intersegmental pathways to create a seamless transition between Mesa and k-12, non-credit, Universities, and careers (✓)
- **Scholarship - Objective 2:** Evaluate and improve Diversity, Equity, and Inclusion practice in classroom environments, campus activities, departments, schools, and administrative units (✓)
- **Scholarship - Objective 3:** Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)
- **Stewardship - Objective 2:** Support processes and initiatives that prioritize environmental sustainability and reduce Mesa College's impact on climate change (✓)
- **Stewardship - Objective 3:** Increase student access and schedule efficiency by coordinating schedules among departments/disciplines (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)