

Instructional Program Review 2019/20 UPDATE

Chemistry

Created on: 10/15/2019 10:33:00 AM PST
Last Modified: 01/10/2020 01:04:37 PM PST

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General Information (Instructional Program Review 2019/20 UPDATE)

2019/20 Instructional Program Review

SUBMISSION INFORMATION AND UPDATES (REQUIRED)

- Name of Lead Writer: Dr. Paula Hjorth-Gustin
- Name of Liaison: Robert Wong
- Department Chair: Dr. Donna Budzynski
- Name of Manager/Service Area Supervisor: Dean Susan Topham
- Is this a CTE program? (State Yes or No): No

The Chemistry Department success rate since 2014 has been 77% with the 2018-1019 year having a success rate at 78%. This is higher than the overall college success rate of 72% since 2014 and the 2018-2019 college success rate of 73%. The retention rate of the chemistry department is 89% and above the college's retention rate of 87%. The chemistry department student GPA is very similar to the colleges rate (2.79 vs. 2.77). The chemistry department offers wide variety of courses and has a healthy enrollment. In Fall 2018, we offered 93 sections while in Spring 2019 there were 96 sections. Summer 2019 had 35 sections. We offer a full array of courses for science majors: Preparatory Chemistry (Chemistry 152/152L), General Chemistry (Chemistry 200 & 201), Organic Chemistry series (Chem 231, 233), and Analytical Chemistry (Chem 251). We also support allied health majors with Chemistry 100, 103, 130, and 160. We also offer one course for non-science majors general education, Chemistry 111/111L. Since Mesa College is a Hispanic Serving Institution, it is important to assess the success rates of Latin X students. This will be discussed in detail in the equity section of this Program Review.

One of the major goals of our department as a whole is to improve student success. How do we approach student success? The main ways our department approaches student success is by working together as a team to update our curriculum to better improve student understanding, make curriculum changes to help students reach their academic goals, and to communicate extensively with each other to ensure cohesiveness within our department.

In terms of curriculum updating, the department has worked very hard as a team to reach goals outlined in last years Program Review. Dr. Saidane has completely re-written the Chemistry 231L and 233L manuals and has been actively streamlining the manual based on student feedback. Dr. Joe Toto has continued to revise the Chemistry 201L manual. Jessica Sardo has been an excellent addition to our department as a full-time tenure track faculty since Spring 2019. She has developed and implemented a new course for Mesa College, Chemistry 103, that is a course for nursing majors. It allows them to complete their introductory chemistry and organic chemistry in one semester. Ms. Danica Moore is also a great addition to our department as a full-time tenure track position since Spring 2019. She revitalized the Chemistry 100L course by writing completely new laboratory curriculum and she is in the process of assessing its effectiveness. Dr. Fusco Hernandez has been updating the Chemistry 152L manual. Dr. Budzynski is currently revising the Chemistry 251 manual. Mr. Robert Fremland has updated the manual for Chemistry 111L (non-science majors GE course) and has introduced new laboratory experiments that apply chemistry to real world problems. These revisions are done by active communication among faculty. This is a very amazing and collaborative department!

Over the last 2 years, our department has been actively involved in developing curriculum that institutionalizes the successful approaches of small workshop style pedagogy. Our faculty has actively utilized Classroom Tutors (for 100 level courses) and Peer Mentors (200/201) in order to improve student success. These programs not only provide additional support for students, but also provide the tutors and mentors a valuable experience that can be added to their resumes. Since these programs are grant funded and finite in length, the chemistry department has developed two new support courses so that the department can sustain their approach. Chemistry 16 which is a workshop style course to help students in Chemistry 152 problem solving. Our internal data collection showed (discussed in last Program Review) that this approach is successful in closing equity gaps. Changes in math curriculum due to AB 705

have allowed some students to skip vital algebra courses (data not available on numbers). This will mean that Chemistry 16 may prove to be even more vital to the success of our students. Currently two sections are being offered. Counseling has anecdotal evidence saying that students are happy with this course. Our department will be assessing its success over the next year. Chemistry 20 is an online course that will be taught for the first time this intercession. It is designed to help students prepare for General Chemistry I. Some students need a refresher course before starting General Chemistry. Our department is hoping that this helps student success rates in Chemistry 200. Data will also be collected over the next year.

Developing new curriculum in order to meet student needs is so important. We were aware that Mesa chemistry department needed to better serve nursing major students. Chemistry 103 was activated and developed to help nursing majors have the opportunity to complete their general chemistry in one semester. This course has been offered for the first time this semester. Data will be collected over the next year in order to optimize course offerings. Currently, we are offering one section, but hope to expand if enrollment data supports this. The data collected will also include an analysis of the success of underrepresented groups in science.

Pathways has also been an important discussion within our department over the last year. Dr. Hjorth-Gustin chaired a STEM Pathways work group among selected representatives from STEM faculty. Dr. Gergens was actively involved in Pathways discussions at the campus level. The chemistry mapping is complete. This project has strengthened our discussions with our departments. We also have a much stronger communication with counseling. It is our hope that our mapping will help students more clearly understand their placement into general chemistry, length of chemistry pathway, and differences in pathway to UCSD vs. SDSU.

Central to the success of students is the cohesiveness of the department since our curriculum is set up in sequences of courses. This requires us as a department to work together to ensure that the courses are at the appropriate level so that students can be successful in the next course. Adherence to the course outlines is also critical because our students are transferring to CSU or UC and must be prepared for upper division work at the four-year institution not only in chemistry, but in many science majors that require chemistry. One of our goals in the department was to provide an organized faculty mentoring program within our department. Dr. Hjorth-Gustin (Assistant Chair) and Dr. Budzynski (Dept. Chair) set up a formal process to ensure that any new adjunct had a mentor within the department to provide them with as much information as needed including course outlines, PowerPoints, exams, and quizzes if needed. Frequent communication between adjunct and mentor was encouraged via e-mail or in person. In this way, the adjunct can feel supported and part of the department. Since there are two new tenure-track faculty involved in General Chemistry, the department is currently setting up a work group to provide more detailed explanations of the course outline of records. It is our hope that these types of discussions can help provide consistency between the courses in a sequence of courses.

New goals for our department focus on helping students to gain a culture of STEM which means to help them to develop the study skills and mindset needed to be successful in chemistry. Our department hopes to develop a Personal Growth course for STEM. Working closely with counseling, we hope to adjust an existing course or develop a new course to help students early on in their pathway develop study skills to be successful. In addition we hope to offer more research opportunities for students and will be implementing a workgroup to address grant proposals and their implementation.

OUTCOMES AND ASSESSMENT (REQUIRED)

Form: 2019/20 Program Review Outcomes and Assessment Section (See appendix)

File Attachments:

1. ChemDepAssPlanF18S19.pptx

PROGRAM ANALYSIS FOR EQUITY AND EXCELLENCE (REQUIRED)

Form: 2019/20 Program Review Instructional Program Analysis Section (See appendix)

PROGRAM GOALS (REQUIRED)

2018/2019

Goal 1: Clarify Chemistry Student Pathways

This is a short term goal. We are working on clarifying to students the various student pathways and sub-pathways for chemistry. These include Allied Health pathways, STEM pathways and General Education Pathways.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 2.2, Strategic Goal 2.4

Goal 2: Update Lab Manuals and/or Experiments

This is a short term goal. Several of our lab classes need updating of either their lab manuals or experiments, or both. For some of these courses this is already in progress. For others it will begin in the next year. The courses are: Chem 100L, 111L, 130L, 201L, 231L, 233L, 251. These updates will include such things as clarifying some instructions and introductory material for better student understanding, revising/replacing some experiments to better coordinate with lecture material, revising/replacing some experiments to make them more interesting and relevant for students, revising/replacing some experiments to make them safer for students and/or the environment, revising/replacing some experiments to make them less costly.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.6, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 6.1, Strategic Goal 6.2,

Institutional Learning Outcomes 2016/17: Critical Thinking, Global Consciousness, Information Literacy,

Program Learning Outcomes for Chemistry: PLO #1: Communication, PLO #2: Critical Thinking, PLO #3: Technology awareness, PLO #4: Personal responsibility, PLO #5: Environmental Responsibility

Goal 3: Update the Chemistry component of the pre-Allied Health Pathway

This is a short term goal. Currently at Mesa, pre-Allied Health students in many fields take the Chem 100/100L Chem 130/130L sequence. However, many programs, especially in Nursing, accept the single semester, 5 unit, GOB (General, Organic, and Biochemistry) Chem 103 course currently offered at Miramar and other local colleges. This course includes both a lecture and lab component. We have activated that course and will be offering it in Fall 2019. So, this goal will involve the scheduling, start up and initial evaluation of the success of this course at Mesa.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 3.1, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 6.1, Strategic Goal 6.2,

Institutional Learning Outcomes 2016/17: Communication, Critical Thinking, Information Literacy, Professional & Ethical Behavior,

Program Learning Outcomes for Chemistry: PLO #1: Communication, PLO #2: Critical Thinking, PLO #3: Technology awareness, PLO #4: Personal responsibility, PLO #5: Environmental Responsibility

Goal 4: Improving Student Success in the General Chemistry Sequence

This is a short term goal. The general chemistry courses we will be focusing on are Chem 152 and Chem 200. Both of these courses are required for a large number of STEM majors including Biology, Chemistry, Biochemistry, several Engineering fields, and others. These are two of our highest enrollment courses. Our goal for these courses is to improve the overall success rate and close the equity gap between underrepresented groups, especially LatinX students, and white and Asian students. This will be accomplished in part by introducing two new "helper" courses, Chem 016 (to be taken by students in need of extra help in conjunction with Chem 152) and 020 (to be taken by at risk students before starting Chem 200). Both of these courses will be introduced in the 19/20 school year. A large part of this goal involves the scheduling, planning, implementation and evaluation of the initial success of these courses. Other actions for this goal will be describe further in the Action section.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 4.1, Strategic Goal 4.2,

Institutional Learning Outcomes 2016/17: Critical Thinking, Information Literacy,

Program Learning Outcomes for Chemistry: PLO #1: Communication, PLO #2: Critical Thinking, PLO #3: Technology awareness

Goal 5: Maintain Excellence in Instruction by Mentoring New Faculty

This is a long term goal, with some short term components. We have one recent contract hire (Fall 2017) and two brand new contract hires (starting in Spring 2019). Although all three of these hires are amazing, excellent faculty, they will require continued mentoring over the next few years. Additionally, 15 % of our sections in Spring of 2019 are being taught by adjunct faculty that have been hired since Fall 2017. These newer adjuncts also require continued mentoring. All this hiring was due to retirement of faculty and expansion of class offerings. The majority of the full time professors in the department will retire in 5 - 10 years. And we anticipate to continue to expand the offerings in some courses.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.6, Strategic Goal 2.3, Strategic Goal 4.1, Strategic Goal 5.1, Strategic Goal 5.2

Goal 6: Expansion of Organic Chemistry Offerings

This is a long term goal, with some short term components. This goal involves our sophomore level organic chemistry courses, Chem 231/231L and 233/233L. These courses are required for many STEM transfer students including those majoring in Chemistry, Biochemistry and Biology. They are required by professional programs such as Medical, Pharmacy and Dental schools. We would like to expand our offering by increasing the number of sections in both of these courses. We recently added an additional lab section to Chem 231L and it filled easily. Considering the large number of students who complete the pre-requisite General Chemistry sequence (Chem 200/200L and 201/201L) at Mesa, we should be able to fill more sections of these courses. Our current limiting factor is lab and lecture space. In order to accomplish this goal completely, in the long term we will need to retrofit another lab room and purchase equipment to be able to utilize it for these sophomore level courses.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6,

Institutional Learning Outcomes 2016/17: Communication, Critical Thinking, Information Literacy, Professional & Ethical Behavior,

Program Learning Outcomes for Chemistry: PLO #1: Communication, PLO #2: Critical Thinking, PLO #3: Technology awareness, PLO #4: Personal responsibility, PLO #5: Environmental Responsibility

Goal 7: Finish Development and Implementation of Associate Degree in Biochemistry

This is short term goal. This work is already in progress. We currently offer various associate degrees in Chemistry and Biology, but none in Biochemistry. Since this is a very common STEM major and many of our students actually major in this upon transfer, it makes sense that we would offer an associate degree in this interdisciplinary field.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.4, Strategic Goal 1.6

Goal 8: Enrollment Management

This is a short term goal. With the new funding formula in place, it is imperative we continue to follow, analyze, right size and otherwise manage the enrollment in Chemistry. We will be continuing to look at ways to increase offerings in courses with high fill rates, such as Chem 152/152L and the organic chemistry sequence. Although most courses in Chemistry are seeing stable or increasing enrollment, in a few instances we may need to adjust our offerings.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 6.1

Improve Student Study Skills in Chemistry

Work with counseling to develop a Personal Growth Course for STEM.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4

Research Evaluation Workgroup

A work group will be established to support faculty interested in student research projects. This will allow the department to review the research and provide feedback to feasibility, cost, and safety issues.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 2.1, Strategic Goal 4.1, Strategic Goal 5.2

ACTION PLANS FOR GOALS (REQUIRED)

Actions

2018/2019

Goal

Goal: Goal 1: Clarify Chemistry Student Pathways

This is a short term goal. We are working on clarifying to students the various student pathways and sub-pathways for chemistry. These include Allied Health pathways, STEM pathways and General Education Pathways.

Action: Work in MS STEM Pathways Workgroup

Describe the actions needed to achieve this objective: -Collaborate with MS STEM Pathways work group members from Physics, Math, Bio, and STEM counselor.
-Develop documents for students to understand Chem pathways.
-Develop website with Chem pathways information.

Who will be responsible for overseeing the completion of this objective: Paula Hjorth-Gustin

Provide a timeline for the actions: -Ongoing. -Work to be completed in Spring 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective: -The documents for students will be available for the dean to review.
-The information will be available on the website.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other): -Faculty, including counseling.
-Classified staff (help with website).

Goal: Goal 2: Update Lab Manuals and/or Experiments

This is a short term goal. Several of our lab classes need updating of either their lab manuals or experiments, or both. For some of these courses this is already in progress. For others it will begin in the next year. The courses are: Chem 100L, 111L, 130L, 201L, 231L, 233L, 251. These updates will include such things as clarifying some instructions and introductory material for better student understanding, revising/replacing some experiments to better coordinate with lecture material, revising/replacing some experiments to make them more interesting and relevant for students, revising/replacing some experiments to make them safer for students and/or the environment, revising/replacing some experiments to make them less costly.

Action: Update Chem 100L Lab Manual

Describe the actions needed to achieve this objective: -Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.

- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective: Danica Moore

Provide a timeline for the actions: Work will begin in Spring 2019. Partial implementation by Fall 2019. Full implementation by Fall 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Action: Update Chem 111L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective: Rob Fremland

Provide a timeline for the actions: Currently ongoing. To be completed by Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective: A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

Action: Update Chem 130L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Ed Alexander

Provide a timeline for the actions:

Work currently in progress Partial implementation by Spring 2019. Full implementation by Fall 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Action: Update Chem 201L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Joe Toto

Provide a timeline for the actions:

Work will begin in Spring 2019. Partial implementation by Fall 2019. Full implementation by Fall 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Action: Update Chem 231L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Saloua Saidane, with input from Sudhakar Kalagara and Dwayne Gergens

Provide a timeline for the actions:

Work in progress. To be completed by Fall 2019

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Action: Update Chem 233L Lab Manual

Describe the actions needed to achieve this

-Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments

objective:	that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented. - Coordination with ILTs to insure implementation of any experimental changes. - Testing of new procedures if needed. - Coordination and communication of changes with all instructors teaching the course. - Ongoing communication of progress with department chair and assistant chair.
Who will be responsible for overseeing the completion of this objective:	Saloua Saidane, with input from Sudhakar Kalagara.
Provide a timeline for the actions:	Work in progress. To be completed by Fall 2019
Describe the assessment plan you will use to know if the objective was achieved and effective:	- Any new experiments will be performed by students and results will be shared between faculty teaching the course. - A new lab manual will be available for student use.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	- Faculty time to review and update manual, and communicate with department. - Potential faculty and ILT time to test procedures. - Supplies as needed for new experiments.

Action: Update Chem 251 Lab Manual

Describe the actions needed to achieve this objective:	-Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented. - Coordination with ILTs to insure implementation of any experimental changes. - Testing of new procedures if needed.
Who will be responsible for overseeing the completion of this objective:	Donna Budzynski
Provide a timeline for the actions:	Work in progress. To be completed by end of Spring 2019
Describe the assessment plan you will use to know if the objective was achieved and effective:	- A new lab manual will be available for student use.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software,	- Faculty time to review and update manual, and communicate with department. - Potential faculty and ILT time to test procedures. - Supplies as needed for new experiments.

Facilities, Classified Staff, Faculty, Other):

Goal: Goal 3: Update the Chemistry component of the pre-Allied Health Pathway

This is a short term goal. Currently at Mesa, pre-Allied Health students in many fields take the Chem 100/100L Chem 130/130L sequence. However, many programs, especially in Nursing, accept the single semester, 5 unit, GOB (General, Organic, and Biochemistry) Chem 103 course currently offered at Miramar and other local colleges. This course includes both a lecture and lab component. We have activated that course and will be offering it in Fall 2019. So, this goal will involve the scheduling, start up and initial evaluation of the success of this course at Mesa.

Action: Initial Offerings of Lab portion of Chem 103

Describe the actions needed to achieve this objective:

- Development/Selection of Lab Manual
- Selection of Experiments
- Coordination with lecture topics
- Coordination with ILTs for ordering of supplies/testing of experiments
- Setup of Chem 130L laboratory for Chem 103
- Development of experiment schedule
- Communication of progress with department chair and assistant chair

Who will be responsible for overseeing the completion of this objective:

Sudhakar Kalagara and Jessica Sardo

Provide a timeline for the actions:

Begin Spring 2019 and continue through Fall 2019 and Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Student success in Chem 103 will be monitored in Fall 2019 and Spring 2020.
- Lab manual will be available for student use.
- Results of student experiments will be monitored and evaluated.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time
- Classified (ILT) time: ordering any new supplies, setup of 130L room to accommodate Chem 103
- Supplies and equipment as needed for experiments

Action: Initial Offerings of Lecture portion of Chem 103

Describe the actions needed to achieve this objective:

- Textbook selection
- Lecture material development

Who will be responsible for overseeing the completion of this objective:

Sudhakar Kalagara and Jessica Sardo

Provide a timeline for the

Begin Spring 2019 and continue through Fall 2019.

actions:

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Student success in Chem 103 will be monitored in Fall 2019 and Spring 2020.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time
- Possible software and supplies (to be determined).

Action: Scheduling of Chem 103 sections

Describe the actions needed to achieve this objective:

- Determination of best times for lecture and lab components
- Finding a lecture room (this lecture meets for 4 hours per week so scheduling across blocks will be tricky).
- Working with chair and dean to determine best instructor for initial offering for Fall 2019.
- Determination of number of sections for future semesters.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Initial offering (Fall 2019) will be scheduled in February - March 2019. -Second offering (Spring 2020) will be scheduled in Summer 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

The enrollment of the course in Fall 2019 and Spring 2020 will be watched carefully. Fill rate will determine if any changes need to be made.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time (scheduler and dept chair)
- Manager time (dean)

Goal: Goal 4: Improving Student Success in the General Chemistry Sequence

This is a short term goal. The general chemistry courses we will be focusing on are Chem 152 and Chem 200. Both of these courses are required for a large number of STEM majors including Biology, Chemistry, Biochemistry, several Engineering fields, and others. These are two of our highest enrollment courses. Our goal for these courses is to improve the overall success rate and close the equity gap between underrepresented groups, especially LatinX students, and white and Asian students. This will be accomplished in part by introducing two new "helper" courses,

Chem 015 (to be taken by students in need of extra help in conjunction with Chem 152) and 020 (to be taken by at risk students before starting Chem 200). Both of these courses will be introduced in the 19/20 school year. A large part of this goal involves the scheduling, planning, implementation and evaluation of the initial success of these courses. Other actions for this goal will be describe further in the Action section.

Action: Establishment of General Chemistry Success Workgroup

Describe the actions needed to achieve this objective:	In order to facilitate new ideas for general chemistry student success, monitor and coordinate startup and existing programs (tutoring, peer mentoring, classroom tutors, Chem 015 and Chem 020), and monitor/ evaluate student success and equity gaps, a work group of interested faculty will be established.
Who will be responsible for overseeing the completion of this objective:	Donna Budzynski
Provide a timeline for the actions:	Spring 2019
Describe the assessment plan you will use to know if the objective was achieved and effective:	-The work group will share minutes with the chemistry department and the dean. -Student success in general chemistry courses before and after the work group was established will be monitored and compared.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	-Faculty

Action: Expansion and Coordination of Peer Mentoring

Describe the actions needed to achieve this objective:	In Fall 2018, with funding from the HSI STEM Title V, Peer Mentors were utilized for one instructor's sections of Chem 200. The project was very well liked by these Chem 200 students. In future semesters, this will be expanded, pending funding. We will need to: -Coordinate the Peer Mentors with the Chem 200 instructors. -Work with Peer Mentors on the topics they will cover. -Coordinate people working with the HSI STEM grant. -Identify other potential sources of funding for expansion.
Who will be responsible for overseeing the completion of this objective:	-In Spring 2019 (and possibly subsequent semesters), Amanda Fusco-Hernandez will be responsible for the first three items. -Identifying other potential sources of funding will be coordinated by Donna Budzynski and Paula Hjorth-Gustin.
Provide a timeline for the actions:	This action started in Fall 2018 and will continue as long as we can keep it funded.
Describe the assessment plan you will use to know if	-Success of students in Chem 200 using Peer Mentoring versus those who do not will be evaluated.

the objective was achieved and effective:

- Overall student success rate in Chem 200 before and after Peer Mentoring was offered will be compared.
- Equity gaps in Chem 200 will be compared from before and after Peer Mentoring was offered.
- Note: much of this assessment will be done by people in the HSI STEM program, not the Chemistry Department.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time.
- Student Mentor compensation (especially once the grant runs out in a few years).
- Classrooms or other rooms to meet in.

Action: Initial Offering of Chem 016

Describe the actions needed to achieve this objective:

- This is a supplemental course for Chem 152 (see section on Curriculum). to start offering this course, we will need to:
- identify students who would benefit and encourage them to register.
 - develop a schedule of topics to be covered.
 - develop material to be used.
 - facilitate ongoing communication with Chem 152 instructors.
 - communicate progress to department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Amanda Fusco-Hernandez

Provide a timeline for the actions:

Startup work will start in Spring 2019 and continue through Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Enrollment in Chem 016 will be monitored.
- Success of students in Chem 152 taking 016 versus those who do not will be evaluated.
- Overall student success rate in Chem 152 before and after 016 was offered will be compared.
- Equity gaps in Chem 152 will be compared from before and after 016 was offered.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time.
- Supplies such as copy paper and toner.

Action: Initial Offering of Chem 020

Describe the actions needed to achieve this

This is a supplemental course for Chem 200 (see section on Curriculum). to start offering this course, we will need to:

objective:	<ul style="list-style-type: none"> - identify students who would benefit and encourage them to register. - develop a schedule of topics to be covered. -learn how to use the ALEK software. -setup the ALEK software for use in Chem 020. -facilitate ongoing communication with Chem 200 instructors. -communicate progress to department chair and assistant chair.
Who will be responsible for overseeing the completion of this objective:	Amanda Fusco-Hernandez
Provide a timeline for the actions:	Startup work will start in Spring 2019 and continue through Fall 2020.
Describe the assessment plan you will use to know if the objective was achieved and effective:	<ul style="list-style-type: none"> -Enrollment in Chem 020 will be monitored. -Success of students in Chem 200 taking 020 versus those who do not will be evaluated. -Overall student success rate in Chem 200 before and after 020 was offered will be compared. -Equity gaps in Chem 200 will be compared from before and after 020 was offered.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	<ul style="list-style-type: none"> - Faculty time -ALEK software (already used in Math department).

Action: Scheduling of Chem 016 sections

Describe the actions needed to achieve this objective:	<ul style="list-style-type: none"> -Determination of best times - Finding lecture rooms - Working with chair and dean to determine number of sections and instructors for initial offering in Fall 2019. - Determination of number of sections for future semesters.
Who will be responsible for overseeing the completion of this objective:	Donna Budzynski
Provide a timeline for the actions:	- Initial offering (Fall 2019) will be scheduled in February - March 2019. -Second offering (Spring 2020) will be scheduled in Summer 2019.
Describe the assessment plan you will use to know if the objective was achieved and effective:	-The enrollment of the course in Fall 2019 and Spring 2020 will be watched carefully. Fill rate will determine if any changes need to be made.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &	<ul style="list-style-type: none"> - Faculty time (scheduler and dept chair) - Manager time (dean)

Conference, Software, Facilities, Classified Staff, Faculty, Other):

Action: Scheduling of Chem 020 sections

Describe the actions needed to achieve this objective:

- Working with chair and dean to determine number of sections and instructors for initial offering in Intersession 2020.
- Determination of number of sections for future semesters.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Initial offering (Intersession 2020) will be scheduled in Fall 2019. -Second offering (Summer 2020) will be scheduled in Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- The enrollment of the course in Intersession 2020 and Summer 2020 will be watched carefully. Fill rate will determine if any changes need to be made.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time (scheduler and dept chair)
- Manager time (dean)
- Software (this course will be offered using ALEK software. This is already used in other departments, such as Math).

Goal: Goal 5: Maintain Excellence in Instruction by Mentoring New Faculty

This is a long term goal, with some short term components. We have one recent contract hire (Fall 2017) and two brand new contract hires (starting in Spring 2019). Although all three of these hires are amazing, excellent faculty, they will require continued mentoring over the next few years. Additionally, 15 % of our sections in Spring of 2019 are being taught by adjunct faculty that have been hired since Fall 2017. These newer adjuncts also require continued mentoring. All this hiring was due to retirement of faculty and expansion of class offerings. The majority of the full time professors in the department will retire in 5 - 10 years. And we anticipate to continue to expand the offerings in some courses.

Action: Mentoring of New Adjunct Faculty

Describe the actions needed to achieve this objective:

- Most newer adjunct faculty have already been assigned a mentor. These should be reevaluated depending on the adjuncts current schedule, and the contract faculties' availability.
- We have one brand new adjunct starting in Spring 2019. She needs to be assigned a mentor.
- Mentors and their adjunct faculty mentee should meet as needed, and communicate regularly.
- An updated chemistry department checklist/guide for new adjunct faculty should be developed.

Who will be responsible for overseeing the completion of this objective:	Paula Hjorth-Gustin and Donna Budzynski
Provide a timeline for the actions:	-Ongoing for current "newer" adjuncts. -Spring 2019 for new hire. -This process will continue as long as we continue to hire adjuncts. -Fall 2019 for checklist/guide.
Describe the assessment plan you will use to know if the objective was achieved and effective:	-Adjuncts will overall have favorable student evaluations. -Success rates for Chemistry courses will stay the same or increase.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	-Faculty

Action: Mentoring of New Contract Faculty

Describe the actions needed to achieve this objective:	-Mentors for two new faculty starting in Spring 2019 to be selected. -Mentoring for Sudhakar Kalagara (hired for Fall 2017) will continue -Mentors will meet regularly with new faculty.
Who will be responsible for overseeing the completion of this objective:	Paula Hjorth-Gustin
Provide a timeline for the actions:	2017 hire: Ongoing New hires: Begins Spring 2019. Continues until all faculty have been tenured.
Describe the assessment plan you will use to know if the objective was achieved and effective:	-New faculty will successfully complete the tenure process.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	-Faculty

Goal: Goal 6: Expansion of Organic Chemistry Offerings

This is a long term goal, with some short term components. This goal involves our sophomore level organic chemistry courses, Chem 231/231L and 233/233L. These courses are required for many STEM transfer students including those majoring in Chemistry, Biochemistry and Biology. They are required by professional programs such as Medical,

Pharmacy and Dental schools. We would like to expand our offering by increasing the number of sections in both of these courses. We recently added an additional lab section to Chem 231L and it filled easily. Considering the large number of students who complete the pre-requisite General Chemistry sequence (Chem 200/200L and 201/201L) at Mesa, we should be able to fill more sections of these courses. Our current limiting factor is lab and lecture space. In order to accomplish this goal completely, in the long term we will need to retrofit another lab room and purchase equipment to be able to utilize it for these sophomore level courses.

Action: Evaluate increasing current offering of 231/231L and 233/233L

Describe the actions needed to achieve this objective:

- Look carefully at usage in current lab room (MS 407) to see how to effectively maximize space usage.
- Work with ILTs to develop an expanded schedule that still allows for safe and effective lab usage .
- Work with chair and dean to decide if more sections can be added.
- Work with chair and dean to identify instructors.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

-Analysis to start in Spring 2019. -Possible section increase in Fall 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

If new sections are added, enrollment and fill rate will be assessed.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty (time for assessment and instructor FTEF).
- Supplies: chemicals and additional lab supplies.
- Classified: ILT time for prepping more sections.

Action: Evaluate larger increase in offering of 231/231L and 233/233L

Describe the actions needed to achieve this objective:

Because the current room (MS407) for these courses, we will only be able to offer a very limited number of new sections there. To increase the offering further, we will need to add additional lab space, possibly by retrofitting a current chemistry lab (MS414). This lab is used for Chem 130L which has a limited number of sections. It will also be used for the new Chem 103. In order to further expand 231L/233L we need to:

- evaluate the feasibility of retrofitting MS414 to be used for these classes (which need a larger amount of fume hood space than is currently available in that room).
- get a rough estimate for the cost this would incur.
- decide if this is necessary and cost effective.
- look for funding/shared funding.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

This is a long term goal. First we will see how many sections we can safely and effectively fit into MS407. Once we increase those offerings (possibly in the 2019/2020 school year), we will watch enrollment to see if more sections are necessary. In the meantime, we can look into the possibility of the room retrofit. Overall timeline: 5 years.

Describe the assessment plan you will use to know if the objective was achieved and effective:

If the project was deemed necessary and completed we would see a large increase in the enrollments of Chem 231/231L and 233/233L.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to evaluate. If sections are eventually added, FTEF for instruction.
- Classified (ILTs). More sections mean more time to prep.
- Supplies and equipment: more sections = more chemicals and equipment.
- Renovation cost. This would be an expensive project. Fume hoods alone cost several thousand dollar each, and this lab would require 9 large ones. In order to fit them, the front of the lab would need to rotate 90 degrees to a smaller wall, similar to the configuration of MS 407. Add to that construction and other furniture/equipment and this room reno would run hundreds of thousands of dollars.

Goal: Goal 7: Finish Development and Implementation of Associate Degree in Biochemistry

This is short term goal. This work is already in progress. We currently offer various associate degrees in Chemistry and Biology, but none in Biochemistry. Since this is a very common STEM major and many of our students actually major in this upon transfer, it makes sense that we would offer an associate degree in this interdisciplinary field.

Action: Completion and Establishment of Biochemistry Associates Degree

Describe the actions needed to achieve this objective:

This work has already started. The program has been designed and entered into Curricunet. To complete the goal the following needs to be done:

- Collaborate with the articulation officer
- Complete and submit the state chancellor's narrative paperwork.
- Complete the curriculum review process.

Who will be responsible for overseeing the completion of this objective:

Paula Hjorth-Gustin

Provide a timeline for the actions:

Ongoing. To be completed Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- the degree will be offered by Mesa college.
- eventually we will see students selecting and completing the degree.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time.
- Articulation officer time.

Faculty, Other):

Goal: Goal 8: Enrollment Management

This is a short term goal. With the new funding formula in place, it is imperative we continue to follow, analyze, right size and otherwise manage the enrollment in Chemistry. We will be continuing to look at ways to increase offerings in courses with high fill rates, such as Chem 152/152L and the organic chemistry sequence. Although most courses in Chemistry are seeing stable or increasing enrollment, in a few instances we may need to adjust our offerings.

Action: Monitor and Evaluate enrollment in Chemistry

Describe the actions needed to achieve this objective:

- The chemistry scheduler will work with the department chair and dean to monitor fill rates in chemistry courses and specific sections.
- Classes with very high fill rates will be evaluated for section increases.
- Classes with low fill rates will be evaluated for section decreases.
- New classes (Chem 103, 016 and 020) will be monitored and adjusted as needed.
- Efforts will be made to offer sections at popular, convenient times for students.
- Efforts will be made to offer sections that do not conflict with courses in other STEM departments that students typically take concurrently.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

-Ongoing and continuous. However, with the new funding formula in place, special care will be taken between now and 2021. -For new offerings: Fall 2019 - Spring 2021.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Chemistry department enrollments will remain constant or increase overall.
- Chemistry department fill rates will remain constant or increase overall.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time.
- Facilities: to offer more sections of lecture we will need more available lecture rooms.
- Facilities: we are at or near capacity for some of our lab courses. To increase sections in some of these courses, we would need more lab space.

Goal: Improve Student Study Skills in Chemistry

Work with counseling to develop a Personal Growth Course for STEM.

Action: Plan for development of Personal Growth for STEM course

Describe the actions needed to achieve this

The main action would be to work with counseling liaison to discuss.

objective:

Who will be responsible for overseeing the completion of this objective: Dr. Paula Hjorth-Gustin

Provide a timeline for the actions: One year time period.

Describe the assessment plan you will use to know if the objective was achieved and effective: The assessment plan will include the planning and developing of the course and implementation by Fall 2021.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other): Facilities and faculty

Goal: Research Evaluation Workgroup

A work group will be established to support faculty interested in student research projects. This will allow the department to review the research and provide feedback to feasibility, cost, and safety issues.

Action: Formation of Research Work Group

Describe the actions needed to achieve this objective: A departmental work group will need to be established and meeting times set. The goals of the group would need to be determined and could include: venue for faculty to design student research projects and criteria for evaluation of safety and feasibility of projects.

Who will be responsible for overseeing the completion of this objective: Dr. Budzynski

Provide a timeline for the actions: one year timeframe

Describe the assessment plan you will use to know if the objective was achieved and effective: Regular meetings and process in place.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other): faculty involvement

GOAL STATUS REPORT (REQUIRED)

Action Statuses

2018/2019

Goal

Goal: Goal I: Clarify Chemistry Student Pathways

This is a short term goal. We are working on clarifying to students the various student pathways and sub-pathways for chemistry. These include Allied Health pathways, STEM pathways and General Education Pathways.

Action: Work in MS STEM Pathways Workgroup

Describe the actions needed to achieve this objective:

- Collaborate with MS STEM Pathways work group members from Physics, Math, Bio, and STEM counselor.
- Develop documents for students to understand Chem pathways.
- Develop website with Chem pathways information.

Who will be responsible for overseeing the completion of this objective:

Paula Hjorth-Gustin

Provide a timeline for the actions:

-Ongoing. -Work to be completed in Spring 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- The documents for students will be available for the dean to review.
- The information will be available on the website.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty, including counseling.
- Classified staff (help with website).

Status for Work in MS STEM Pathways Workgroup

Current Status:

Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

The mapping that has been completed will help students better navigate towards transfer. It also provides a lot of information regarding placement into General Chemistry. It has allowed our department to strengthen ties with other departments and counseling.

If the Current Status was

**not marked Completed,
what are the implications
and next steps:**

Goal: Goal 2: Update Lab Manuals and/or Experiments

This is a short term goal. Several of our lab classes need updating of either their lab manuals or experiments, or both. For some of these courses this is already in progress. For others it will begin in the next year. The courses are: Chem 100L, 111L, 130L, 201L, 231L, 233L, 251. These updates will include such things as clarifying some instructions and introductory material for better student understanding, revising/replacing some experiments to better coordinate with lecture material, revising/replacing some experiments to make them more interesting and relevant for students, revising/replacing some experiments to make them safer for students and/or the environment, revising/replacing some experiments to make them less costly.

Action: Update Chem 100L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Danica Moore

Provide a timeline for the actions:

Work will begin in Spring 2019. Partial implementation by Fall 2019. Full implementation by Fall 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 100L Lab Manual

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

This project has updated the curriculum for Allied Health Majors. It has provided more clarity in the manual. It has provided new, student centered, and more engaging laboratory work. The bulk of the work has been completed. However, it takes time to get student feedback on the manual so revisions will be done over the next year to optimize.

Action: Update Chem 111L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Rob Fremland

Provide a timeline for the actions:

Currently ongoing. To be completed by Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 111L Lab Manual

Current Status: Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

This manual has been updated to provide more clarity in the experiments. Some experiments that did not provide good data were removed and replaced by other experiments. The experiments are ones that provide a large deal of knowledge in a fun experiment.

If the Current Status was not marked Completed, what are the implications and next steps:

Action: Update Chem 130L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Ed Alexander

Provide a timeline for the actions:

Work currently in progress Partial implementation by Spring 2019. Full implementation by Fall 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 130L Lab Manual

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on

This manual needed major revisions to be more modern. Some of the experiments have been updated. There is still work to be done on it.

your program:

If the Current Status was not marked Completed, what are the implications and next steps:

Action: Update Chem 201L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Joe Toto

Provide a timeline for the actions:

Work will begin in Spring 2019. Partial implementation by Fall 2019. Full implementation by Fall 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 201L Lab Manual

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications

This is manual has been updated to provide clarity for students. Main revisions were done in several experiments to help students understand the conceptual side of the labs.

and next steps: Dr. Toto still has plans for other revisions. It is a work in progress.

Action: Update Chem 231L Lab Manual

Describe the actions needed to achieve this objective:

- Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.
- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Saloua Saidane, with input from Sudhakar Kalagara and Dwayne Gergens

Provide a timeline for the actions:

Work in progress. To be completed by Fall 2019

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 231L Lab Manual

Current Status: Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

Manual revisions have been completed. This lab manual is modern and is excellent in terms of content.

If the Current Status was not marked Completed, what are the implications and next steps:

Action: Update Chem 233L Lab Manual

Describe the actions

- Existing manual will be evaluated and updated for clarity of instructions, end of lab

needed to achieve this objective:

questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.

- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.
- Coordination and communication of changes with all instructors teaching the course.
- Ongoing communication of progress with department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Saloua Saidane, with input from Sudhakar Kalagara.

Provide a timeline for the actions:

Work in progress. To be completed by Fall 2019

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Any new experiments will be performed by students and results will be shared between faculty teaching the course.
- A new lab manual will be available for student use.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to review and update manual, and communicate with department.
- Potential faculty and ILT time to test procedures.
- Supplies as needed for new experiments.

Status for Update Chem 233L Lab Manual

Current Status:

Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

This manual has been completely rewritten and modernized.

If the Current Status was not marked Completed, what are the implications and next steps:

Action: Update Chem 251 Lab Manual

Describe the actions needed to achieve this objective:

-Existing manual will be evaluated and updated for clarity of instructions, end of lab questions, figures and equations, and introductory material. Changes to experiments that need to be updated or replaced to improve student success, safety, environmental impact or relevance will be implemented.

- Coordination with ILTs to insure implementation of any experimental changes.
- Testing of new procedures if needed.

Who will be responsible for overseeing the completion of this objective:	Donna Budzynski
Provide a timeline for the actions:	Work in progress. To be completed by end of Spring 2019
Describe the assessment plan you will use to know if the objective was achieved and effective:	- A new lab manual will be available for student use.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	<ul style="list-style-type: none"> - Faculty time to review and update manual, and communicate with department. - Potential faculty and ILT time to test procedures. - Supplies as needed for new experiments.

Status for Update Chem 251 Lab Manual

Current Status:	In Progress
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	The lab manual is currently being revised and revision will be completed by Fall 2020.
If the Current Status was not marked Completed, what are the implications and next steps:	

Goal: Goal 3: Update the Chemistry component of the pre-Allied Health Pathway

This is a short term goal. Currently at Mesa, pre-Allied Health students in many fields take the Chem 100/100L Chem 130/130L sequence. However, many programs, especially in Nursing, accept the single semester, 5 unit, GOB (General, Organic, and Biochemistry) Chem 103 course currently offered at Miramar and other local colleges. This course includes both a lecture and lab component. We have activated that course and will be offering it in Fall 2019. So, this goal will involve the scheduling, start up and initial evaluation of the success of this course at Mesa.

Action: Initial Offerings of Lab portion of Chem 103

Describe the actions needed to achieve this objective:	<ul style="list-style-type: none"> - Development/Selection of Lab Manual - Selection of Experiments - Coordination with lecture topics - Coordination with ILTs for ordering of supplies/testing of experiments -Setup of Chem 130L laboratory for Chem 103
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Who will be responsible for overseeing the completion of this objective:

- Development of experiment schedule
- Communication of progress with department chair and assistant chair

Sudhakar Kalagara and Jessica Sardo

Provide a timeline for the actions:

Begin Spring 2019 and continue through Fall 2019 and Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Student success in Chem 103 will be monitored in Fall 2019 and Spring 2020.
- Lab manual will be available for student use.
- Results of student experiments will be monitored and evaluated.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time
- Classified (ILT) time: ordering any new supplies, setup of 130L room to accommodate Chem 103
- Supplies and equipment as needed for experiments

Status for Initial Offerings of Lab portion of Chem 103

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

This course was offered for the first time Fall 2019.
The course manual was a combination of existing curriculum.
The effectiveness of the lab manual is being monitored with the goal of streamlining it over the next year.

Action: Initial Offerings of Lecture portion of Chem 103

Describe the actions needed to achieve this objective:

- Textbook selection
- Lecture material development

Who will be responsible for overseeing the completion of this objective:

Sudhakar Kalagara and Jessica Sardo

Provide a timeline for the actions:

Begin Spring 2019 and continue through Fall 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Student success in Chem 103 will be monitored in Fall 2019 and Spring 2020.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time
- Possible software and supplies (to be determined).

Status for Initial Offerings of Lecture portion of Chem 103

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

This course was successfully offered Fall 2019 and will become a regular course offering at San Diego Mesa College. Streamlining of course materials will be done throughout this academic year.

Action: Scheduling of Chem 103 sections

Describe the actions needed to achieve this objective:

- Determination of best times for lecture and lab components
- Finding a lecture room (this lecture meets for 4 hours per week so scheduling across blocks will be tricky).
- Working with chair and dean to determine best instructor for initial offering for Fall 2019.
- Determination of number of sections for future semesters.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Initial offering (Fall 2019) will be scheduled in February - March 2019. -Second offering (Spring 2020) will be scheduled in Summer 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

The enrollment of the course in Fall 2019 and Spring 2020 will be watched carefully. Fill rate will determine if any changes need to be made.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff,

- Faculty time (scheduler and dept chair)
- Manager time (dean)

Faculty, Other):

Status for Scheduling of Chem 103 sections

Current Status: Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

The course was successfully offered Fall 2019.
The department will continue to offer the course as an option for Nursing Majors.

If the Current Status was not marked Completed, what are the implications and next steps:

Goal: Goal 4: Improving Student Success in the General Chemistry Sequence

This is a short term goal. The general chemistry courses we will be focusing on are Chem 152 and Chem 200. Both of these courses are required for a large number of STEM majors including Biology, Chemistry, Biochemistry, several Engineering fields, and others. These are two of our highest enrollment courses. Our goal for these courses is to improve the overall success rate and close the equity gap between underrepresented groups, especially LatinX students, and white and Asian students. This will be accomplished in part by introducing two new "helper" courses, Chem 015 (to be taken by students in need of extra help in conjunction with Chem 152) and 020 (to be taken by at risk students before starting Chem 200). Both of these courses will be introduced in the 19/20 school year. A large part of this goal involves the scheduling, planning, implementation and evaluation of the initial success of these courses. Other actions for this goal will be describe further in the Action section.

Action: Establishment of General Chemistry Success Workgroup

Describe the actions needed to achieve this objective:

In order to facilitate new ideas for general chemistry student success, monitor and coordinate startup and existing programs (tutoring, peer mentoring, classroom tutors, Chem 015 and Chem 020), and monitor/ evaluate student success and equity gaps, a work group of interested faculty will be established.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

Spring 2019

Describe the assessment plan you will use to know if the objective was achieved and effective:

-The work group will share minutes with the chemistry department and the dean.
-Student success in general chemistry courses before and after the work group was established will be monitored and compared.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer

-Faculty

Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

Status for Establishment of General Chemistry Success Workgroup

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

Chemistry 16 was offered Fall 2019 and was very successful.
Chemistry 20 will be offered Intersession 2020.
There are on going meetings to determine if the sections will be expanded.

Action: Expansion and Coordination of Peer Mentoring

Describe the actions needed to achieve this objective:

In Fall 2018, with funding from the HSI STEM Title V, Peer Mentors were utilized for one instructor's sections of Chem 200. The project was very well liked by these Chem 200 students. In future semesters, this will be expanded, pending funding. We will need to:

- Coordinate the Peer Mentors with the Chem 200 instructors.
- Work with Peer Mentors on the topics they will cover.
- Coordinate people working with the HSI STEM grant.
- Identify other potential sources of funding for expansion.

Who will be responsible for overseeing the completion of this objective:

-In Spring 2019 (and possibly subsequent semesters), Amanda Fusco-Hernandez will be responsible for the first three items.
-Identifying other potential sources of funding will be coordinated by Donna Budzynski and Paula Hjorth-Gustin.

Provide a timeline for the actions:

This action started in Fall 2018 and will continue as long as we can keep it funded.

Describe the assessment plan you will use to know if the objective was achieved and effective:

-Success of students in Chem 200 using Peer Mentoring versus those who do not will be evaluated.
-Overall student success rate in Chem 200 before and after Peer Mentoring was offered will be compared.
-Equity gaps in Chem 200 will be compared from before and after Peer Mentoring was offered.
-Note: much of this assessment will be done by people in the HSI STEM program, not the Chemistry Department.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer

-Faculty time.
-Student Mentor compensation (especially once the grant runs out in a few years).
-Classrooms or other rooms to meet in.

Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

Status for Expansion and Coordination of Peer Mentoring

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

Peer Mentoring is a program that the chemistry department is committed to and that it actively supports. Faculty work with peer mentors on a regular basis so they can better support students. Peer Mentoring has expanded not only to Chem 200 , but also to Chemistry 201. There are qualified mentors and students are attending sessions.

Action: Initial Offering of Chem 016

Describe the actions needed to achieve this objective:

This is a supplemental course for Chem 152 (see section on Curriculum). to start offering this course, we will need to:

- identify students who would benefit and encourage them to register.
- develop a schedule of topics to be covered.
- develop material to be used.
- facilitate ongoing communication with Chem 152 instructors.
- communicate progress to department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Amanda Fusco-Hernandez

Provide a timeline for the actions:

Startup work will start in Spring 2019 and continue through Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Enrollment in Chem 016 will be monitored.
- Success of students in Chem 152 taking 016 versus those who do not will be evaluated.
- Overall student success rate in Chem 152 before and after 016 was offered will be compared.
- Equity gaps in Chem 152 will be compared from before and after 016 was offered.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff,

- Faculty time.
- Supplies such as copy paper and toner.

Faculty, Other):

Status for Initial Offering of Chem 016

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

This course has been successful Fall 2019 (with two sections offered). The department will continue to offer in Spring 2020. Data and feedback will be collected over the next year.

Action: Initial Offering of Chem 020

Describe the actions needed to achieve this objective:

This is a supplemental course for Chem 200 (see section on Curriculum). to start offering this course, we will need to:

- identify students who would benefit and encourage them to register.
- develop a schedule of topics to be covered.
- learn how to use the ALEK software.
- setup the ALEK software for use in Chem 020.
- facilitate ongoing communication with Chem 200 instructors.
- communicate progress to department chair and assistant chair.

Who will be responsible for overseeing the completion of this objective:

Amanda Fusco-Hernandez

Provide a timeline for the actions:

Startup work will start in Spring 2019 and continue through Fall 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Enrollment in Chem 020 will be monitored.
- Success of students in Chem 200 taking 020 versus those who do not will be evaluated.
- Overall student success rate in Chem 200 before and after 020 was offered will be compared.
- Equity gaps in Chem 200 will be compared from before and after 020 was offered.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time
- ALEK software (already used in Math department).

Status for Initial Offering of Chem 020

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

This course is scheduled for Intercession 2020.

Action: Scheduling of Chem 016 sections

Describe the actions needed to achieve this objective:

- Determination of best times
- Finding lecture rooms
- Working with chair and dean to determine number of sections and instructors for initial offering in Fall 2019.
- Determination of number of sections for future semesters.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Initial offering (Fall 2019) will be scheduled in February - March 2019. -Second offering (Spring 2020) will be scheduled in Summer 2019.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- The enrollment of the course in Fall 2019 and Spring 2020 will be watched carefully. Fill rate will determine if any changes need to be made.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time (scheduler and dept chair)
- Manager time (dean)

Status for Scheduling of Chem 016 sections

Current Status: In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was

not marked Completed, what are the implications and next steps:

This course is offered Intercession 2020. Its enrollment is being monitored and its success will be assessed. It is hopeful that it will be offered Summer 2020.

Action: Scheduling of Chem 020 sections

Describe the actions needed to achieve this objective:

- Working with chair and dean to determine number of sections and instructors for initial offering in Intercession 2020.
- Determination of number of sections for future semesters.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Initial offering (Intercession 2020) will be scheduled in Fall 2019. -Second offering (Summer 2020) will be scheduled in Spring 2020.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- The enrollment of the course in Intercession 2020 and Summer 2020 will be watched carefully. Fill rate will determine if any changes need to be made.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time (scheduler and dept chair)
- Manager time (dean)
- Software (this course will be offered using ALEK software. This is already used in other departments, such as Math).

Status for Scheduling of Chem 020 sections

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

Chemistry 20 is being offered for the first time Intercession 2020. Its enrollment is being monitored. It is hoped to be offered again in Summer 2020.

Goal: Goal 5: Maintain Excellence in Instruction by Mentoring New Faculty

This is a long term goal, with some short term components. We have one recent contract hire (Fall 2017) and two brand new contract hires (starting in Spring 2019). Although all three of these hires are amazing, excellent faculty, they will require continued mentoring over the next few years. Additionally, 15 % of our sections in Spring of 2019 are being

taught by adjunct faculty that have been hired since Fall 2017. These newer adjuncts also require continued mentoring. All this hiring was due to retirement of faculty and expansion of class offerings. The majority of the full time professors in the department will retire in 5 - 10 years. And we anticipate to continue to expand the offerings in some courses.

Action: Mentoring of New Adjunct Faculty

Describe the actions needed to achieve this objective:

- Most newer adjunct faculty have already been assigned a mentor. These should be reevaluated depending on the adjuncts current schedule, and the contract faculties' availability.
- We have one brand new adjunct starting in Spring 2019. She needs to be assigned a mentor.
- Mentors and their adjunct faculty mentee should meet as needed, and communicate regularly.
- An updated chemistry department checklist/guide for new adjunct faculty should be developed.

Who will be responsible for overseeing the completion of this objective:

Paula Hjorth-Gustin and Donna Budzynski

Provide a timeline for the actions:

- Ongoing for current "newer" adjuncts. -Spring 2019 for new hire. -This process will continue as long as we continue to hire adjuncts. -Fall 2019 for checklist/guide.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Adjuncts will overall have favorable student evaluations.
- Success rates for Chemistry courses will stay the same or increase.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty

Status for Mentoring of New Adjunct Faculty

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

- A concerted effort was made to mentor new faculty especially those in lecture. These efforts included:
- faculty mentors and new faculty frequent communication
 - sharing of teaching materials
 - active communication within the evaluation process

If the Current Status was not marked Completed, what are the implications and next steps:

Action: Mentoring of New Contract Faculty

Describe the actions needed to achieve this objective:	-Mentors for two new faculty starting in Spring 2019 to be selected. -Mentoring for Sudhakar Kalagara (hired for Fall 2017) will continue -Mentors will meet regularly with new faculty.
Who will be responsible for overseeing the completion of this objective:	Paula Hjorth-Gustin
Provide a timeline for the actions:	2017 hire: Ongoing New hires: Begins Spring 2019. Continues until all faculty have been tenured.
Describe the assessment plan you will use to know if the objective was achieved and effective:	-New faculty will successfully complete the tenure process.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	-Faculty

Status for Mentoring of New Contract Faculty

Current Status:	In Progress
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	New contract faculty are being mentored by active communication with faculty mentor(s) to ensure teaching levels are appropriate. There is active sharing of course materials. There is active communication among mentors during the evaluation process.
If the Current Status was not marked Completed, what are the implications and next steps:	

Goal: Goal 6: Expansion of Organic Chemistry Offerings

This is a long term goal, with some short term components. This goal involves our sophomore level organic chemistry courses, Chem 231/231L and 233/233L. These courses are required for many STEM transfer students including those majoring in Chemistry, Biochemistry and Biology. They are required by professional programs such as Medical, Pharmacy and Dental schools. We would like to expand our offering by increasing the number of sections in both of these courses. We recently added an additional lab section to Chem 231L and it filled easily. Considering the large number of students who complete the pre-requisite General Chemistry sequence (Chem 200/200L and 201/201L) at Mesa, we should be able to fill more sections of these courses. Our current limiting factor is lab and lecture space. In order to accomplish this goal completely, in the long term we will need to retrofit another lab room and purchase

equipment to be able to utilize it for these sophomore level courses.

Action: Evaluate increasing current offering of 231/231L and 233/233L

Describe the actions needed to achieve this objective:	<ul style="list-style-type: none"> -Look carefully at usage in current lab room (MS 407) to see how to effectively maximize space usage. -Work with ILTs to develop an expanded schedule that still allows for safe and effective lab usage . -Work with chair and dean to decide if more sections can be added. -Work with chair and dean to identify instructors.
Who will be responsible for overseeing the completion of this objective:	Donna Budzynski
Provide a timeline for the actions:	-Analysis to start in Spring 2019. -Possible section increase in Fall 2019.
Describe the assessment plan you will use to know if the objective was achieved and effective:	If new sections are added, enrollment and fill rate will be assessed.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	<ul style="list-style-type: none"> -Faculty (time for assessment and instructor FTEF). -Supplies: chemicals and additional lab supplies. -Classified: ILT time for prepping more sections.

Status for Evaluate increasing current offering of 231/231L and 233/233L

Current Status:	In Progress
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	
If the Current Status was not marked Completed, what are the implications and next steps:	Continued monitoring of enrollment trends to ascertain need for expansion.

Action: Evaluate larger increase in offering of 231/231L and 233/233L

Describe the actions needed to achieve this objective:	Because the current room (MS407) for these courses, we will only be able to offer a very limited number of new sections there. To increase the offering further, we will need to add additional lab space, possibly by retrofitting a current chemistry lab (MS414). This lab is used for Chem 130L which has a limited number of sections. It
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will also be used for the new Chem 103. In order to further expand 231L/233L we need to:

- evaluate the feasibility of retrofitting MS414 to be used for these classes (which need a larger amount of fume hood space than is currently available in that room).
- get a rough estimate for the cost this would incur.
- decide if this is necessary and cost effective.
- look for funding/shared funding.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

This is a long term goal. First we will see how many sections we can safely and effectively fit into MS407. Once we increase those offerings (possibly in the 2019/2020 school year), we will watch enrollment to see if more sections are necessary. In the meantime, we can look into the possibility of the room retrofit. Overall timeline: 5 years.

Describe the assessment plan you will use to know if the objective was achieved and effective:

If the project was deemed necessary and completed we would see a large increase in the enrollments of Chem 231/231L and 233/233L.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time to evaluate. If sections are eventually added, FTEF for instruction.
- Classified (ILTs). More sections mean more time to prep.
- Supplies and equipment: more sections = more chemicals and equipment.
- Renovation cost. This would be an expensive project. Fume hoods alone cost several thousand dollar each, and this lab would require 9 large ones. In order to fit them, the front of the lab would need to rotate 90 degrees to a smaller wall, similar to the configuration of MS 407. Add to that construction and other furniture/equipment and this room reno would run hundreds of thousands of dollars.

Status for Evaluate larger increase in offering of 231/231L and 233/233L

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

The enrollment is being monitored to ascertain need for expansion.

Goal: Goal 7: Finish Development and Implementation of Associate Degree in Biochemistry

This is short term goal. This work is already in progress. We currently offer various associate degrees in Chemistry and Biology, but none in Biochemistry. Since this is a very common STEM major and many of our students actually

major in this upon transfer, it makes sense that we would offer an associate degree in this interdisciplinary field.

Action: Completion and Establishment of Biochemistry Associates Degree

Describe the actions needed to achieve this objective:	This work has already started. The program has been designed and entered into Curricunet. To complete the goal the following needs to be done: -Collaborate with the articulation officer -Complete and submit the state chancellor's narrative paperwork. -Complete the curriculum review process.
Who will be responsible for overseeing the completion of this objective:	Paula Hjorth-Gustin
Provide a timeline for the actions:	Ongoing. To be completed Spring 2020.
Describe the assessment plan you will use to know if the objective was achieved and effective:	-the degree will be offered by Mesa college. -eventually we will see students selecting and completing the degree.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	-Faculty time. -Articulation officer time.

Status for Completion and Establishment of Biochemistry Associates Degree

Current Status:	In Progress
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	
If the Current Status was not marked Completed, what are the implications and next steps:	More discussion with counseling on this is needed. Changes in Biochemistry at UCSD need to be discussed.

Goal: Goal 8: Enrollment Management

This is a short term goal. With the new funding formula in place, it is imperative we continue to follow, analyze, right size and otherwise manage the enrollment in Chemistry. We will be continuing to look at ways to increase offerings in courses with high fill rates, such as Chem 152/152L and the organic chemistry sequence. Although most courses in Chemistry are seeing stable or increasing enrollment, in a few instances we may need to adjust our offerings.

Action: Monitor and Evaluate enrollment in Chemistry

Describe the actions needed to achieve this objective:

- The chemistry scheduler will work with the department chair and dean to monitor fill rates in chemistry courses and specific sections.
- Classes with very high fill rates will be evaluated for section increases.
- Classes with low fill rates will be evaluated for section decreases.
- New classes (Chem 103, 016 and 020) will be monitored and adjusted as needed.
- Efforts will be made to offer sections at popular, convenient times for students.
- Efforts will be made to offer sections that do not conflict with courses in other STEM departments that students typically take concurrently.

Who will be responsible for overseeing the completion of this objective:

Donna Budzynski

Provide a timeline for the actions:

- Ongoing and continuous. However, with the new funding formula in place, special care will be taken between now and 2021.
- For new offerings: Fall 2019 - Spring 2021.

Describe the assessment plan you will use to know if the objective was achieved and effective:

- Chemistry department enrollments will remain constant or increase overall.
- Chemistry department fill rates will remain constant or increase overall.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

- Faculty time.
- Facilities: to offer more sections of lecture we will need more available lecture rooms.
- Facilities: we are at or near capacity for some of our lab courses. To increase sections in some of these courses, we would need more lab space.

Status for Monitor and Evaluate enrollment in Chemistry

Current Status:

In Progress

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

Scheduler is constantly studying fill rates in order to serve student needs. This is an ongoing process.

Goal: Improve Student Study Skills in Chemistry

Work with counseling to develop a Personal Growth Course for STEM.

Action: Plan for development of Personal Growth for STEM course

Describe the actions needed to achieve this objective:	The main action would be to work with counseling liaison to discuss.
Who will be responsible for overseeing the completion of this objective:	Dr. Paula Hjorth-Gustin
Provide a timeline for the actions:	One year time period.
Describe the assessment plan you will use to know if the objective was achieved and effective:	The assessment plan will include the planning and developing of the course and implementation by Fall 2021.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	Facilities and faculty

Status for Plan for development of Personal Growth for STEM course

Current Status:	Not started
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	
If the Current Status was not marked Completed, what are the implications and next steps:	New goal for this next cycle

Goal: Research Evaluation Workgroup

A work group will be established to support faculty interested in student research projects. This will allow the department to review the research and provide feedback to feasibility, cost, and safety issues.

Action: Formation of Research Work Group

Describe the actions needed to achieve this objective:	A departmental work group will need to be established and meeting times set. The goals of the group would need to be determined and could include: venue for faculty to design student research projects and criteria for evaluation of safety and feasibility
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	of projects.
Who will be responsible for overseeing the completion of this objective:	Dr. Budzynski
Provide a timeline for the actions:	one year timeframe
Describe the assessment plan you will use to know if the objective was achieved and effective:	Regular meetings and process in place.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	faculty involvement

Status for Formation of Research Work Group

Current Status:	Not started
If the Current Status was marked Completed, what was the impact of the completed objective on your program:	
If the Current Status was not marked Completed, what are the implications and next steps:	New goal for this cycle

Request Forms

CLASSIFIED POSITION, BARC AND FACULTY POSITION REQUEST

Reviewers

LIAISON'S REVIEW

Form: Instructional Program Liaison's Review 2019/20 UPDATE

MANAGER'S REVIEW

Form: Instructional Program Manager's Review 2019/20 UPDATE

Appendix

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- A. **2019/20 Program Review Outcomes and Assessment Section** (Form)
 - B. **2019/20 Program Review Instructional Program Analysis Section** (Form)
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Form: "2019/20 Program Review Outcomes and Assessment Section"

Created with : Taskstream

Participating Area: Chemistry

(REQUIRED) Program name

Chemistry

(REQUIRED) Are you on target with your assessment schedule?

Yes. The Chemistry Department has completed its assessment schedule as outlined and described in the attachment. Benchmarks were met in all of our courses. This was year three and we assessed structure and properties.

(REQUIRED) What have your assessments revealed about your courses/programs/service area/school/division/office?

Since benchmarks were met for our courses, the assessment reveal that we are on track in our department regarding Course Learning Outcomes. This reveals that we have been successful as a department in regards to structure and properties. The attachment gives more detail regarding each course. The department met with respect to our findings which generated a lot of thoughtful conversation for how to improve in this area. These discussions help us as a department to standardize how we teach the material which is important as students move through one course to the next in a sequence.

(REQUIRED) Based on your assessments, what resource needs have you identified?

Based on our assessment, the main resources that we have identified is to continue to utilize classroom tutors, peer mentors, and develop support courses to help students to succeed. This is discussed in detail in the introduction to this document and also in the equity analysis.

Please provide any other comments.

No answer specified

Form: "2019/20 Program Review Instructional Program Analysis Section"

Created with : Taskstream
Participating Area: Chemistry

Program Name

(REQUIRED) Type your program name.

Chemistry

Part A: In this section, please analyze your program in terms of course success metric. Start by disaggregating the available data by race, gender, and any other parameters of interest to your program and answer the following questions.

(REQUIRED) A1. What patterns do you notice with regard to equity in course success at the program level by race/ethnicity?

You may also conduct analysis by course and/or by modality.

Equity Gap: When a group of students who share a common characteristic (e.g. race/ethnicity) have lower access and/or outcome rates than their peers. The size of the equity gap along with the size of the group determine whether that gap is significant. Larger groups should, statistically, have smaller gaps and therefore when gaps are present (even small ones) they may be significant. Smaller groups will see wider variation in outcomes, therefore gaps should be seen consistently over time and/or reviewed by looking at multiple years in aggregate to determine if they are significant.

	Latinx Success %	Non-Latinx Success %
Fall '14	65	77
Fall '15	67	78
Fall '16	72	79
Fall '17	74	80
Fall '18	74	79

	Latinx	non-LatinX
Chem 152		
5 yr	65	73
Fall '18	64	73
Chem 200		

Table 2		
	Latinx	non-LatinX
5 yr	60	72
Fall '18	70	73
Chem 201		
5 yr	68	77
Fall '18	71	83
Chem 231		
5 yr	63	70
Fall '18	68	73
Chem 233		
5 yr	72	80
Fall '18	no data	100

(REQUIRED) A2. Do these patterns persist over time (e.g., look at the last five years)? Describe if equity gaps are increasing, decreasing, or staying the same?

As a Hispanic Serving Institution, it is important for our department to examine the success of our Latinx students. (Please refer to Table 1 and 2 above). Chemistry is a foundational course for many majors—engineering, chemistry, biology, physics, nutrition, and nursing. As a result, students interested in STEM or Allied Health majors will begin their journey at Mesa in an introductory/preparatory chemistry course. Therefore, examining equity trends is important so that we can implement strategies, curriculum, and programs that can help close the equity gaps.

Looking at some overall trends, it appears that there has been a steady improvement trend in the last two years of Latinx students in our courses from the success rate of 65% in Fall '14 to a plateau of 74%. This plateau is similar to overall campus success rates. However, the success rate is still lower than the success rate of non-Latinx students. The overall average of Fall data from '14 to '18 is 71% compared to non-Latinx students of 79%. The equity gap was smaller in Fall '17 and Fall '18. More data would need to be collected to determine if this trend remains.

Although we offer a wide variety of courses, this cycle of program review will focus on equity gaps in the science majors sequence. The sequence of Chemistry 152 → Chemistry 200 → Chemistry 201 → Chemistry 231 → Chemistry 233 is a critical sequence for chemistry majors as well as biology majors. If transferring to CSU, most chemistry and biology majors will complete the sequence to at least Chemistry 231. UC transfer students will have to complete through Chemistry 233. Table 2 summarizes some of the data found on the equity dashboard. The equity gaps are different depending on the courses that are being examined. Chemistry 152 shows a larger equity gap between LatinX and non-Latin X students. Chemistry 200 has shown a large equity gap over the last five Fall semesters. However, Fall '18 shows a much smaller gap. More data would need to be collected to determine if this trend remains. Chemistry 201 shows a larger equity gap that remains consistent over the last five

Fall semester. Analyzing the Chemistry 231 shows a closing gap over the 5 year period. The data is not available for Fall '18 for Chemistry 233. There are not enough students (minimum of 10) to have data collected in this course.

(REQUIRED) A3. What factors may have influenced these results? What are your most significant findings?

Our most significant finding is that there is an overall equity gap between Latinx students compared to non-Latinx students over the five Fall semesters examined. There is some variation among courses and variation among semesters. It appears that there is steady improvement, but more data needs to be analyzed.

What are the barriers and obstacles that influence these results? There can be many complicated factors.

- **Societal:** Not all high school experiences are the same. This in turn may suggest that disproportionately impacted groups may lack preparation in high school for STEM courses. Math skills are critical. A strong foundation in algebra is essential for success in chemistry.
- **Institutional:** Following through on the previous bullet, changes in legislation (AB 705) could have serious impact on our chemistry courses, in particular Chemistry 152. This course has a math prerequisite of Math 96, College Algebra. However, the new legislation “encourages” students to start above with trigonometry. This means that students would be entering our chemistry sequence possibly without the critical algebra skills.
- **Individual:** Students may have financial stress so that they have to work a lot of hours. This would make it difficult to put the time into STEM courses. Chemistry is known for being a stressful subject. Our lecture courses require at the very least 6 hours of outside work. However, most students need more than this (6-10) due to the intensity of the material. They may not have the study skills developed for this and they may not have a strong support network outside of school. They may be first-generation college students. Studying chemistry will have high and low points for most students. A support system is so important and our larger class sizes (48) may not work as well for students that need more support.

(REQUIRED) A4. How have you/might you alter practices to increase student success and reduce equity gaps?

What is the chemistry department trying to overcome these barriers and reduce equity gaps?

Over the last three years, our department has tried to actively support students by personalizing our instruction. Many of our instructors go above and beyond to be there for our students. Many offer additional unpaid office hours to tutor students. We have a strong presence in the STEM center as well. We actively participate in Classroom Tutoring (CT) which is for 100 level classes. In this program, the tutor attends the class and then has problem solving sessions with the students. Peer Mentoring is another program for the 200 level courses that allows students to attend problem solving sessions. This is open to all students in the course. This semester was the first semester that Peer Mentoring included Chemistry 201. The data above shows the need for this type of help for Chem 201 students. This may be because Chemistry 201 is such a quantitative course.

In order to institutionalize personalized instruction, we have developed new curriculum. Chemistry 16 was developed which is a workshop style course to help students in Chemistry 152 problem solving. Our internal data collection showed (discussed in last Program Review) that this approach is successful in closing equity gaps. Changes in math curriculum due to AB 705 have allowed some students to skip vital algebra courses (data not available on numbers). This will mean that Chemistry 16 may prove to be even more vital to the success of our students especially in Chemistry 152. Currently two sections are being offered. Counseling has anecdotal evidence saying that students are happy with this course. Our department will be assessing

its success over the next year. Chemistry 20 is an online course that will be taught for the first time this intercession. It is designed to help students prepare for General Chemistry I. Some students need a refresher course before starting General Chemistry. Our department is hoping that this helps student success rates in Chemistry 200. Data will also be collected over the next year. As a department, we are also discussing ways to utilize laboratory time to help students that need more help in math and problem solving.

Unfortunately, the current model of training tutors is not in sync with our students' schedules. We have many students who want to be tutors for chemistry, but are finding the tutor training too cumbersome and so they do not want to participate. Our students have a small window of when they can tutor because of all the STEM requirements. They need flexibility. The tutoring model makes it difficult to keep tutors for our higher level courses.

(REQUIRED) A5. How does your program contribute to the College's identity of being a Hispanic Serving Institution?

Looking at the enrollment numbers, our percentage of Latinx students mirrors fairly close the colleges overall Latinx enrollments. In Fall '18, 37% the students enrolled in chemistry were Latinx which corresponds to 1,042 enrollments. Comparing this number to the last five Fall enrollment values, we have increased by 2%. It is possible that we will continue to increase in Latinx student enrollment. Chemistry is a said to be the central science. This means that every science major (chemistry, biology, physics, and engineering) and most allied health majors (nursing, nutrition) will take at least one course in our department. Because of this, we are at the start of all of these majors pathways. Success in our courses sets the foundation for other coursework. We are a vital department to our college as a Hispanic Serving Institution.

(REQUIRED) A6. Have you identified resource needs? If yes, please list.

The overarching idea is that we have in place in many opportunities for students to get additional help and support from faculty and other students. The difficulty is how to encourage busy students that need the help to attend.

1. Development of a Personal Growth Course for STEM that students take early on their pathway. This would be working with counseling to adjust existing courses. This would enable students to learn the study skills needed to be a successful chemistry major and also understand the time it takes to master this subject.
2. Continue to encourage students to participate in the Classroom Tutoring and Peer Mentoring programs. Find the schedules and number of tutors that will maximize student attendance. Since Peer Mentoring is expanding to Chemistry 201 (which shows a larger equity gap), finds ways to actively encourage students in Chemistry 201 that may benefit the most from these programs.
3. Continue to offer and assess Chemistry 16 and Chemistry 20. Find the optimal times that will maximize student attendance. Find ways to encourage students that will benefit the most.
4. Work closely with counseling liaisons to help encourage our students to enroll in support courses.
5. Faculty mentors within the department should actively encourage adjunct faculty to direct students to these programs including evening students.
6. Our department needs to work with campus research office to get more data regarding algebra level for students entering our track.
7. Our department needs to work with campus research office to get more data regarding persistence of LatinX students in our program. There are some questions that need to be asked regarding persistence from general chemistry through organic chemistry. The numbers provided above are a starting point only. Are Latin X

students transferring more to CSU which would explain lower numbers of Latin X students in Chem 233? Are they changing majors after our general chemistry sequence? What kinds of programs and support courses are needed for them in our organic chemistry sequence? Perhaps, Peer Mentoring for organic? Do we need a support course for the organic sequence?

(REQUIRED) A7. Do any of your program goals address these implications or needs? If not, please develop a new goal that addresses your findings and subsequent reflection.

Our department has worked hard over the last several years to address equity issues. We have developed new curriculum (see above) and have been active in encouraging students to work with classroom tutors, peer mentoring, tutors at tutoring center, and directly seek help from faculty. (see previous sections)

One of our new goals is to develop a Personal Growth STEM course that students can take early on their pathway. We will need to work with counseling to adjust existing courses or develop a new one. We believe that helping students develop study skills early on will help them succeed and that chemistry and other STEM students need to learn specific skills for STEM.

Part B: In this section, look at the area of focus you identified in last year's program review and answer the following questions.

(REQUIRED) B1. How have you developed this focus? Are you seeing any results? What are your next steps?

This question has been addressed in the Program Updates. The chemistry department has been active in faculty mentoring, pathways mapping, development of new curriculum, peer mentoring, faculty mentoring, classroom tutor program, curriculum updating, and new course development. Please see the Program Updates section for more detail.

Over the last 2 years, our department has been actively involved in developing curriculum that institutionalizes the successful approaches of small workshop style pedagogy. Our faculty has actively utilized Classroom Tutors (for 100 level courses) and Peer Mentors (200/201) in order to improve student success. These programs not only provide additional support for students, but also provide the tutors and mentors a valuable experience that can be added to their resumes. Since these programs are grant funded and finite in length, the chemistry department has developed two new support courses so that the department can sustain their approach. Chemistry 16 which is a workshop style course to help students in Chemistry 152 problem solving. Our internal data collection showed (discussed in last Program Review) that this approach is successful in closing equity gaps. Changes in math curriculum due to AB 705 have allowed some students to skip vital algebra courses (data not available on numbers). This will mean that Chemistry 16 may prove to be even more vital to the success of our students. Currently two sections are being offered. Counseling has anecdotal evidence saying that students are happy with this course. Our department will be assessing its success over the next year. Chemistry 20 is an online course that will be taught for the first time this intercession. It is designed to help students prepare for General Chemistry I. Some students need a refresher course before starting General Chemistry. Our department is hoping that this helps student success rates in Chemistry 200. Data will also be collected over the next year.