Allan Hancock College

CHEMISTRY Program Review

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CHEMISTRY
PROGRAM REVIEW

Status Summary - Plan of Action-Post Validation

During the academic year, 2021, 2022 completed program review. The self- study and validation teams developed a final plan of action-post validation based on information in the self study and the recommendations of the validation team. For each plan, indicate the action taken, the result of that action, and the current status of the plan, if it is incomplete.

(If any plan was made and action not taken, please state the rationale for not pursuing that particular item.)

PLAN OF ACTION	ACTION TAKEN ,RESULT, AND STATUS
Support the STEM center by informing students through classroom presentations and other communications.	On going
Increase the awareness and participation of students in science related programs through Bull-Dog Bound and Friday Night Science events.	On going
Increase the number of class sections as demand dictates.	On going, as allowed.
Work with neighboring colleges and universities to ensure that classes articulate (C-ID) and topics are aligned.	On going
Increase the general department budget to accommodate the increase in student population.	Funding strategies will be pursued.
Hire additional chemistry faculty to keep up with growing class sections.	On going, as allowed.
Create published course materials for our campus to utilize to help bring down costs to our students.	On going
Work with other disciplines such as Mathematics that align with our PLOs to help make sure students are prepared.	On going

Chemistry Program Review
Self Study

I. Program Mission:

The chemistry program is one of many disciplines grouped together in the Life and Physical Science department. Many courses require chemistry as a prerequisite to help prepare them for the rigor of other core courses in Biology, Physics, and especially the medical field. These courses enable students to complete lower division requirements for transfer to institutions of higher learning. For science majors, the UC and CSU systems now requires General and Organic Chemistry before transfer.

The chemistry program consists of the following courses:

CHEM110: Chemistry and Society (distance learning)

CHEM120: Introduction to Chemistry (C-ID: CHEM101)

CHEM140: Introduction to Organic and Biological Chemistry (C-ID: CHEM102)

CHEM150: General Chemistry 1 (C-ID: CHEM110)

CHEM151: General Chemistry 2 (C-ID: CHEM120S)

CHEM180: Organic Chemistry 1 (C-ID: CHEM150)

CHEM181: Organic Chemistry 2 (C-ID: CHEM160S)

II. Progress Made Towards Past Program/Department Goals

Headcount for our sections was up to 78% before dropping to 66% due to the COVID-19 pandemic.

Fill rates are greater than 80%, except for CHEM181, which is a continuation course as well as the last course required before transfer.

Full time instruction has increased over part-time instruction (52% vs. 48%) which flipped from last program review.

FTES/FT EF has steadily been increasing from 17.122 to 17.756

Chemistry courses at our satellite campus (LVC) have grown in demand to include the General Chemistry series (CHEM150 and 151). Equipment was purchased for both campuses to ensure equity in instruction and experience in lab.

The Organic Chemistry series (CHEM180 and 181) continues to thrive and fill each Fall semester it is offered. UC and CSU systems recently began requiring these courses for proper transfer.

The chemistry team participates in the Friday Night Science event created by Rob Jorstad. This yearly event continues to help attract attention to our campus and fosters deeper learning in our students before they transfer or graduate.

The chemistry team provides tours of our facilities and works with other disciplines cooperatively when hosting outreach events for elementary and high-school students (Bull-Dog Bound, slime room and other hand-on activities are provided).

The chemistry team provides our time and support to AHC's STEM and MESA programs as well as having a table at BOW-WOW events on both SM and LVC campuses to help promote excitement in the sciences.

III. Analysis of Resource Use and Program Implementation

Current technology and fiscal resources are being utilized to ensure Emergency Remote Learning during the COVID-19 pandemic was as successful as possible. The pandemic stopped all hands-on learning in most chemistry courses and ZOOM/CANVAS became the main modes of teaching. Special cameras and televisions were outfitted in the rooms to capture the instructor and material as best as possible.

As the lab sections grow, the M-building is fully utilized as we accommodate all the different chemistry labs. With only three chemistry labs (M-204/M-213/LVC3-102), the need for more lab space will eventually arise. The increase in lab sections along with retirements has left the chemistry department severely lacking in personnel. Chemistry sections have increased from 43 in 2017-2018 to 47 in 2020-2021. Because of limited rooms for lab, this expansion cannot continue without additional facilities that include gas, water, and fume hoods. Potentially, lab facilities could be added on the Lompoc Valley Campus. During the 2022 year, administrations hopes to hire two full-time chemists to help out the current full-time chemists that have been overloaded for many years now.

IV. Program SLOs/Assessment

Based upon the course statistics and overall data collected from Spring 2016 to Spring 2019:

73% of the students have demonstrated mastery of CHEM PSLO - … the approach and rationale of the scientific method and ability to apply these principles to solve problems.

80% of the students have demonstrated mastery of CHEM PSLO - … stoichiometric calculations.

78% of the students have demonstrated mastery of CHEM PSLO - … laboratory technique.

Our program has been lacking enough full-time faculty to satisfy the growing student population needing access to our courses. While we do have one full-time faculty member consistently teaching one of each of our science major courses (CHEM150, 151, and 180/181), any extra sections of CHEM150, and the majority of CHEM120, is taught by part-time instructors. In addition, we have seen an upward trend in the number of chemistry classes taught per semester (increasing FTES), with more classes being taught by a growing part-time instructor pool. This inconsistency in the instructor pool (sometimes with quick turnover) for some of our most in-demand classes creates data that can be inconsistent. Extra classes not taught by part-time instructors are added onto the load of our understaffed group of full-time faculty members.

Outcomes data for Chemistry from only Spring 2016 to Spring 2019 is available. The previous software for outcomes data was phased out in 2019, so no data was recorded since that time. In addition, data input leading up to the eLumen phase-out lessened, as the department was assured that old data could be entered into the new system once it is up and running. While these are possible reasons for a noticeably lower mastery of PSLO compared to previous years, steps have been discussed and some have already been taken to bolster student success rates in the future. These include updating and/or diversifying instruction methods and materials, and the implementation of outside resources to help improve student success in the classroom and laboratory.

As stated earlier, CHEM120 is primarily taught by part-time instructors, many of which may not teach consecutive semesters for us. As such, SLO data input by part-time instructors is inconsistent. Having a dedicated faculty member teaching CHEM120 consistently may help to achieve a consistent data set for success rate in CHEM120

CHEM150 had been primarily taught by full-time faculty members but has seen an increase in part-time instruction as demand for the class has surged beyond what our full-time faculty can handle. CHEM150 saw the most regular SLO data input out of our courses from Spring 2016 to Fall 2018 (excepting Spring 2017). Most SLOs show steady improvement in standards met after a dip in % from Fall 2016 to Fall 2017. This trend is not entirely clear, though, as there is a lack of SLO data for Spring 2017.

CHEM151 is only taught by full-time faculty. SLO data input was sporadic up until Spring 2018, when a different full-time faculty member became the primary instructor for the course. We feel that data input will continue to be more consistent moving forward. With fewer class offerings than CHEM150, sample sizes will be smaller, though we feel that with regular SLO data input, trends will become more apparent with time.

CHEM180/181 is a relatively new offering. These courses are taught only by full-time faculty. Because these courses are usually required for only a few majors, class sizes tend to be smaller, and the courses are not offered as frequently as our other courses (CHEM120, 150, 151). As such, clear SLO data trends are not available. More regular SLO data input will be practiced moving forward.

It is clear to us that improvements can be made in certain areas of each course to help advance and ensure student success. Even with limited SLO data, the full-time faculty members teaching each course have been working together with clear goals in mind to adapting the courses to better serve the students and encourage success. We feel that the Learning Outcomes Assessment Committee's shift away from SLOs and toward PLOs will help to show how our courses work together to show student success at the program level.

As a program, we will encourage our full-time and part-time instructors to regularly input PLO data into the new SPOL program that has recently launched, so that more telling data can be collected in the future.

V. Distance Learning

CHEMISTRY 110, Catalog Description: An introduction to the fundamentals of chemistry including the composition of matter, energy, and chemical reactions and their application to everyday living. Applications of chemistry in the areas of medicine, nuclear power, plastics, household products, and society's effect on the environment will be emphasized. Intended for non-science majors. Not open to students who are enrolled in or have completed Chemistry 100, 105, or Chemistry 120.

Many online students might not have the organizational skills and the diligence to succeed in an online course. With low faculty numbers and the pandemic demanding other online resources, finding a consistent instructor has been challenging for this course. As a result, the success rate for this course has fallen from the 77% success rate reported last program review. Currently, we have seen the success rate bounce from 63%, down 45%, and back up to 58%. In Fall 2019, a new instructor started teaching the course. Because the former instructor had retired, the course essentially started from scratch. Within 2 semesters, the at-home lab kit that had been used were discontinued. This required the instructor to write in-house labs for the course. This began improving the course success rate, but during the Spring 2021, Fall 2021, and Spring 2022 semesters, there were three separate instructors who taught the course. This complicated the ability to observe true course success rates with fluctuations in teaching styles, expectations, and learning materials. With more faculty hires, we hope to allow an instructor to focus their attention on this course to help improve student success and retention. Without an instructor present, it is no wonder that students would have a greater difficulty succeeding with lab experiments.

VI. Success, Retention, and Equity

We do work very closely with MESA, STEM, Counseling, LAP, and others to ensure student equity and success. Our program is quite highly regarded by our students as shown in the student survey. Our current retention rates in the chemistry program are 85.3 % average over the past six years (2015-2021), with a 71.2% average success rate. The quality of teaching encourages the student diversity and facilitates their success in our programs as shown by the following demographics.

Program Equity: AGE

Equity:AGE	Retention %	Success %
Chemistry program	86.2 % average (2015-2021)	71.0 % average (2015-2021)
Hancock College	89.1 % average (2015-2021)	77.0 % average (2015-2021)

Table 1.1: Average retention and success percentages for gender compared.

The retention and success rate averages over the past six years have been over 70%, with a success percentage of 71.0 compared to the college as a whole with 77.0% as shown in Table 1.1.

Equity:AGE	PPG Retention %	PPG Success %
Chemistry program	-4.1 %	-4.5 %
Hancock College	-1.7 %	-3.9 %

Table 1.2: Impact values for age groups compared.

The success rate of the chemistry program at 65.4 % is below that of the college as a whole as shown in Table 1.2. This factor was due to incoming students <20 years of age having a Percentage Point Gap (PPG) of -4.1% in retention and -4.5% for success. Hancock college as a whole is also struggling in the age category with a PPG of -3.9% for success. From this data, it appears our younger students are coming in less prepared. We need to keep an eye on this trend as more basic skills courses (English and Math) are removed due to recently passed legislature at the state level. Our long term goals will help attempt to address this issue.

Program Equity: ETHNICITY

Equity:ETHNICITY	Retention %	Success %
Chemistry program	78.5 % average (2015-2021)	63.5 % average (2015-2021)
Hancock College	87.9 % average (2015-2021)	74.0 % average (2015-2021)

Table 1.3: Average retention and success percentages for ethnicity compared.

The retention rate averages over the past six years have been over 70%, with a success percentage of 78.5% compared to the college as a whole with 87.9% as shown in Table 1.3. The success percentage of certain ethnicities is at 63.5% and is broken down further below.

Equity:ETHNICITY	PPG Retention %	PPG Success %
Chemistry program	Hispanic: -3.6 %	Hispanic: -6.2%/Nativ Am: -4.8%
Hancock College	Black: -1.1% Hispanic: -1.6% Nativ Am: -2.7% Pac Isl: -1.6%	Black: -5.8% Hispanic: -4.6% Nativ Am: -5.9% Pac Isl: -3.7%

Table 1.4: Impact values for ethnicity compared.

For the chemistry program, Hispanic and Native Americans were negatively impacted as shown in Table 1.4. Hispanic had a retention PPG of -3.6% with a -6.2% success this past 2020-2021 year. The Native American success rate was -4.8% PPG. The college as a whole also has impacted ethnicities as well. Black, Hispanic, Native Americans, and Pacific Islanders were ranging with a PPG of -3.7 to -5.9% for success rates. Our long term goals will help attempt to address this issue.

Program Equity: GENDER

Equity:GENDER	Retention %	Success %
Chemistry program	82.4 % average (2015-2021)	66.5 % average (2015-2021)
Hancock College	88.1 % average (2015-2021)	71.0 % average (2015-2021)

Table 1.5: Average retention and success percentages for gender compared.

The retention rate averages over the past six years have been over 80%, with a success percentage of 82.4% compared to the college as a whole with 88.1% as shown in Table 1.5. The success percentage of the female gender is 64.4% versus 66.8% for males.

Program Equity: 1st Time Student

Equity: 1st Time Student	Retention %	Success %
Chemistry program	86.3 % average (2015-2021)	72.4 % average (2015-2021)
Hancock College	91.6 % average (2015-2021)	78.9 % average (2015-2021)

Table 1.6: Average retention and success percentages for 1st time student compared.

The retention and success rate averages over the past six years have been over 70%, with a success percentage of 72.4% compared to the college as a whole with 78.9% as shown in Table 1.6.

Equity:1st Time	PPG Retention %	PPG Success %
Chemistry program	0.5 %	-10.0 %
Hancock College	-2.2 %	-13.5 %

Table 1.7: Impact values for 1st time students compared.

For 1st time students, the chemistry program had a -10.0% PPG while Hancock college was at -13.5 % PPG as shown by Table 1.7. Our long term goals will help attempt to address this issue.

VII. Trend Analyses/Outlook

The COVID-19 pandemic forced public places to close and would not allow large gatherings of groups. Classes and labs could no longer be held on campus and everyone was forced to teach remotely. Canvas and ZOOM technology was utilized to bring the information to the students as best as possible. Laboratory tactile and technical skills were abandoned for simple exposure by viewing the lab being performed for them. Lab writing skills and knowledge were continued by trying to complete the experiments as best as possible. This will definitely create a small pocket of students that didn't get the chance to handle glassware or have direct exposure in a laboratory setting. Patience will be a virtue going forward to ensure student safety at the higher levels of chemistry.

VIII. Long-Term Program Goals and Action Plans (Aligned With the College Educational Master Plan)

Bring all chemistry courses up-to-date with the Course Identification Numbering System (C-ID). Currently, CHEM140, our introductory organic chemistry course, is not mapped to the C-ID CHEM102. The biochemistry portion of the lecture and lab needs to be updated as well as the organic labs to ensure the students are getting the best exposure possible before moving on in the medical field.

The chemistry program has been mapped to the Guided Pathways to help students navigate the educational system and obtain the degrees desired:
https://www.hancockcollege.edu/pathways/sciences-technologies/chemistry.php

It is of utmost concern and interest to the chemistry team to increase retention and success for all AHC students taking the general chemistry series, organic classes, or simply any non-majors chemistry classes in which they are enrolled. It has been assessed that one of the major hurdles to academic success in

chemistry classes is mathematical competency. Because most chemistry classes require (at the least) a solid understanding of algebra, it is imperative that students enter these classes with algebraic fluency. However, due to recent legislation, Algebra I and II cannot be offered at the community college level. This has caused the chemistry team to consider requiring a supplemental “Math in Chemistry” course to be offered concurrently with the following courses: Chemistry 120, 150, and 151. These courses would allow the hours spent in chemistry lecture and lab to be exclusively focused on chemical theory and application instead of review of mathematical concepts.

A loose breakdown of these supplemental courses would be as follows:

1. Online asynchronous instruction
2. One hour supplemental instruction/week through video lectures
3. One assignment/week focusing on mathematical principles that coincide with concurrent chemistry problems

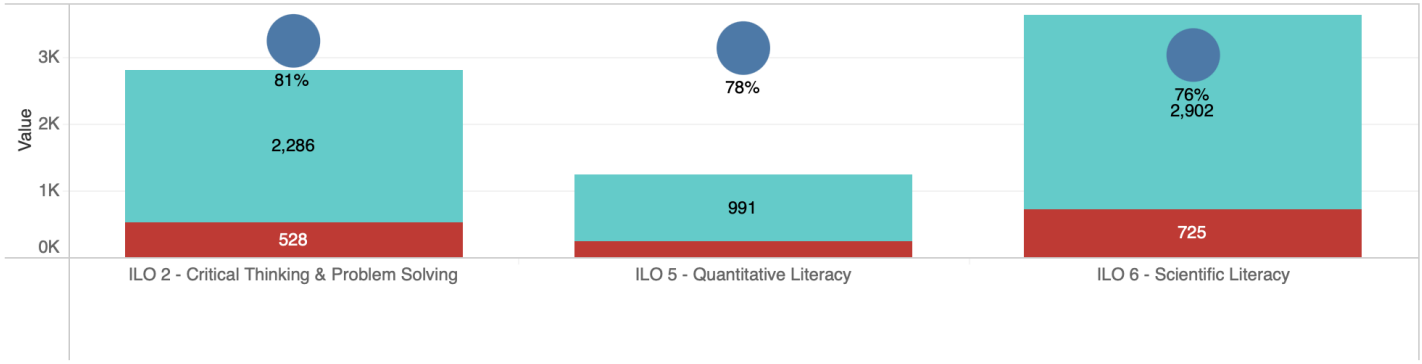
Chemistry Program Review Assessment Plan

ILO Data

Program: Chemistry

Number Met
Number Not Met
Avg. Percent Met

ILO Performance Chart: Chemistry- This is the ILO performance of the program for the past 6 academic years in a table that includes the number of courses that are connected to each ILO.

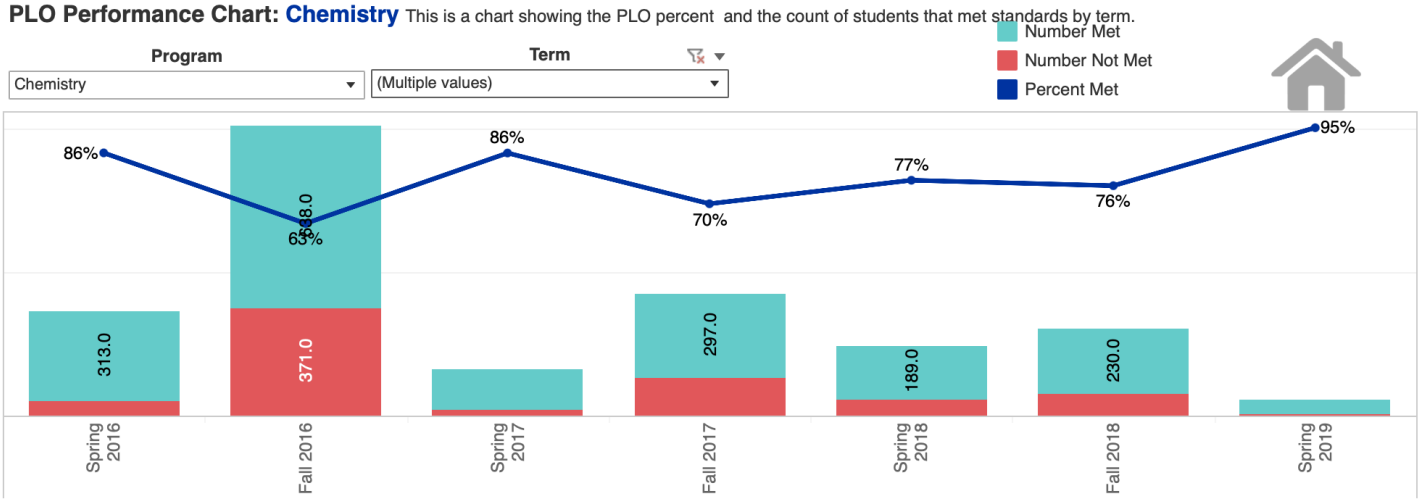


ILO Performance Table: Chemistry- This is the ILO performance of the program for the past 6 academic years.

	# of Connected Courses	Avg. Percent Met	Number Met	Number Not Met
ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.	4	81%	2,286	528
ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems.	4	78%	991	239
ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges.	5	76%	2,902	725

PLO Data

PLO Performance Chart: Chemistry This is a chart showing the PLO percent and the count of students that met standards by term.



PLO Performance Table: Chemistry- This is a table showing the overal PLO performance over the last 6 academic years, including percent and numbers of students meeting standards.

			Number Met	Number Not Met	Percent Met
Chemistry	CHEM1	CHEM PSLO - The student will demonstrate mastery of the approach and rationale of the scientific method and be able to apply these principles to solve problems.	339.0	125.0	73%
	CHEM2	CHEM PSLO - The student will demonstrate mastery of stoichiometric calculations.	825.0	203.0	80%
	CHEM3	CHEM PSLO - The student will demonstrate mastery of laboratory technique.	157.0	45.0	78%
	CHEM4	CHEM PSLO - Course doesn't map to a degree or certificate.	540.0	330.0	62%

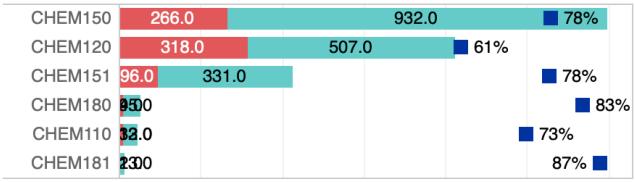
SLO/CLO Data
Spring 2016 – Spring 2019

Program: Chemistry

Term: (Multiple values)

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM110	CHEM110.1	CHEM110 SLO1 - Describe the structure and composition of matter and its relationship to the macroscopic properties of substanc..	22.0	8.0	73%
	CHEM110.5	CHEM110 SLO5 - Demonstrate proficiency with basic chemistry apparatus and analyzing data from experiments.	11.0	4.0	73%
CHEM120	CHEM120.1	CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	220.0	82.0	73%
	CHEM120.2	CHEM120 SLO2 - Write formulas and names of simple compounds and ions.	71.0	59.0	55%
	CHEM120.3	CHEM120 SLO3 - Solve problems related to chemical equations and density.	71.0	59.0	55%
	CHEM120.4	CHEM120 SLO4 - Define and give examples of chemical terms.	74.0	59.0	56%
	CHEM120.5	CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.	71.0	59.0	55%
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	213.0	65.0	77%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	197.0	42.0	82%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	142.0	31.0	82%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	184.0	59.0	76%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	81.0	44.0	65%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	115.0	25.0	82%
CHEM151	CHEM151.1	CHEM151 SLO1 - Perform kinetic calculations.	95.0	9.0	91%
	CHEM151.2	CHEM151 SLO2 - Perform equilibrium calculations.	108.0	26.0	81%
	CHEM151.3	CHEM151 SLO3 - Perform thermodynamic calculations.	70.0	30.0	70%
	CHEM151.4	CHEM151 SLO4 - Define and explain concepts of equilibria.	11.0	8.0	58%
	CHEM151.5	CHEM151 SLO5 - Interpret a pH graph from an acid-base titration.	16.0	9.0	64%
	CHEM151.6	CHEM151 SLO6 - Perform qualitative analysis.	31.0	14.0	69%

CHEM180	CHEM180.1	CHEM180 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure.	15.0	3.0	83%
	CHEM180.2	CHEM180 SLO2 - Define structures of alcohols, alkyl halides, and hydrocarbons and be able to draw the condensed and line-bond formul..	15.0	3.0	83%
	CHEM180.3	CHEM180 SLO3 - Determine reaction mechanisms and propose synthesis routes for organic reactions to be carried out in the	15.0	3.0	83%
CHEM1..	CHEM181.1	CHEM181 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure.	13.0	2.0	87%

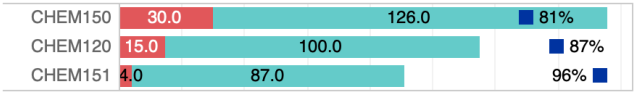
SLO/CLO Data
Spring 2016

Program Chemistry

Term Spring 2016

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM1..	CHEM120.1	CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	100.00	15.00	87%
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	21.00	5.00	81%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	21.00	5.00	81%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	21.00	5.00	81%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	21.00	5.00	81%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	21.00	5.00	81%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	21.00	5.00	81%
CHEM1..	CHEM151.2	CHEM151 SLO2 - Perform equilibrium calculations.	87.00	4.00	96%

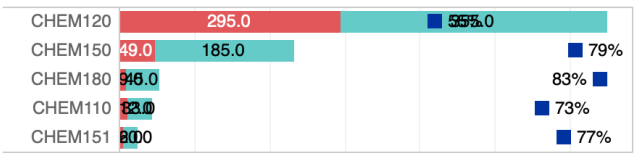
SLO/CLO Data
Fall 2016

Program Chemistry

Term Fall 2016

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM110	CHEM110.1	CHEM110 SLO1 - Describe the structure and composition of matter and its relationship to the macroscopic properties of substanc..	22.00	8.00	73%
	CHEM110.5	CHEM110 SLO5 - Demonstrate proficiency with basic chemistry apparatus and analyzing data from experiments.	11.00	4.00	73%

CHEM120	CHEM120.1	CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	71.00	59.00	55%
	CHEM120.2	CHEM120 SLO2 - Write formulas and names of simple compounds and ions.	71.00	59.00	55%
	CHEM120.3	CHEM120 SLO3 - Solve problems related to chemical equations and density.	71.00	59.00	55%
	CHEM120.4	CHEM120 SLO4 - Define and give examples of chemical terms.	71.00	59.00	55%
	CHEM120.5	CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.	71.00	59.00	55%
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	98.00	28.00	78%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	16.00	1.00	94%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	33.00	7.00	83%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	12.00	5.00	71%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	9.00	8.00	53%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	17.00	0.00	100%
CHEM1..	CHEM151.6	CHEM151 SLO6 - Perform qualitative analysis.	20.00	6.00	77%
CHEM180	CHEM180.1	CHEM180 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure.	15.00	3.00	83%
	CHEM180.2	CHEM180 SLO2 - Define structures of alcohols, alkyl halides, and hydrocarbons and be able to draw the condensed and line-bond formul..	15.00	3.00	83%
	CHEM180.3	CHEM180 SLO3 - Determine reaction mechanisms and propose synthesis routes for organic reactions to be carried out in the	15.00	3.00	83%

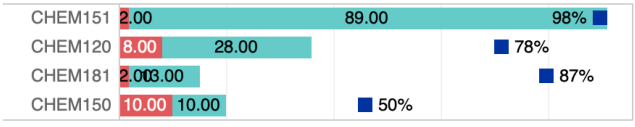
SLO/CLO Data
Spring 2017

Program: Chemistry

Term: Spring 2017

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM1..	CHEM120.1	CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	28.00	8.00	78%
CHEM1..	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	10.00	10.00	50%
CHEM151	CHEM151.1	CHEM151 SLO1 - Perform kinetic calculations.	84.00	1.00	99%
	CHEM151.5	CHEM151 SLO5 - Interpret a pH graph from an acid-base titration.	5.00	1.00	83%
CHEM1..	CHEM181.1	CHEM181 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure.	13.00	2.00	87%

SLO/CLO Data
Fall 2017

Program: Chemistry
Term: Fall 2017

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.

Historical CLO Performance Table: Chemistry- This is a chart of the table above.

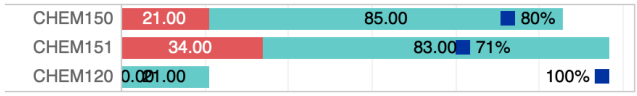
			Number Met	Number Not Met	Percent Met
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	45.0	14.0	76%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	120.0	29.0	81%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	50.0	9.0	85%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	34.0	25.0	58%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	33.0	26.0	56%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	5.0	12.0	29%
CHEM1..	CHEM151.2	CHEM151 SLO2 - Perform equilibrium calculations.	10.0	14.0	42%

SLO/CLO Data
Spring 2018

Program: Chemistry
Term: Spring 2018

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM1..	CHEM120.1	CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	21.00	0.00	100%
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	7.00	2.00	78%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	7.00	2.00	78%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	27.00	7.00	79%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	30.00	6.00	83%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	7.00	2.00	78%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	7.00	2.00	78%

CHEM151	CHEM151.1	CHEM151 SLO1 - Perform kinetic calculations.	4.00	2.00	67%
	CHEM151.2	CHEM151 SLO2 - Perform equilibrium calculations.	4.00	2.00	67%
	CHEM151.3	CHEM151 SLO3 - Perform thermodynamic calculations.	63.00	24.00	72%
	CHEM151.4	CHEM151 SLO4 - Define and explain concepts of equilibria.	4.00	2.00	67%
	CHEM151.5	CHEM151 SLO5 - Interpret a pH graph from an acid-base titration.	4.00	2.00	67%
	CHEM151.6	CHEM151 SLO6 - Perform qualitative analysis.	4.00	2.00	67%

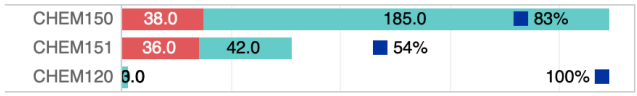
SLO/CLO Data
Fall 2018

Program Chemistry

Term Fall 2018

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM1...	CHEM120.4	CHEM120 SLO4 - Define and give examples of chemical terms.	3.00	0.00	100%
CHEM150	CHEM150.1	CHEM150 SLO1 - Perform stoichiometric calculations.	32.00	6.00	84%
	CHEM150.2	CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	33.00	5.00	87%
	CHEM150.3	CHEM150 SLO3 - Solve questions involving gas laws	11.00	3.00	79%
	CHEM150.4	CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	87.00	18.00	83%
	CHEM150.5	CHEM150 SLO5 - Perform calculations involving thermodynamics.	11.00	3.00	79%
	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	11.00	3.00	79%
CHEM151	CHEM151.1	CHEM151 SLO1 - Perform kinetic calculations.	7.00	6.00	54%
	CHEM151.2	CHEM151 SLO2 - Perform equilibrium calculations.	7.00	6.00	54%
	CHEM151.3	CHEM151 SLO3 - Perform thermodynamic calculations.	7.00	6.00	54%
	CHEM151.4	CHEM151 SLO4 - Define and explain concepts of equilibria.	7.00	6.00	54%
	CHEM151.5	CHEM151 SLO5 - Interpret a pH graph from an acid-base titration.	7.00	6.00	54%
	CHEM151.6	CHEM151 SLO6 - Perform qualitative analysis.	7.00	6.00	54%

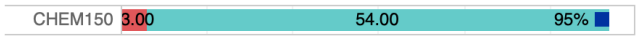
SLO/CLO Data
Spring 2019

Program: Chemistry

Term: Spring 2019

Number Met
Number Not Met
Percent Met

6. Historical Course Performance: Chemistry- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Chemistry- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
CHEM1...	CHEM150.6	CHEM150 SLO6 - Perform laboratory quantitative analysis.	54.00	3.00	95%

Annual Update Student Learning Outcomes Packet

III. Quality and Innovation in the Program and Curriculum Review

Please refer to the current SLO data set for your program found at: http://research.hancockcollege.edu/student_learning_outcomes/matrix.html#Top

a. Are you on track in your assessment plan for course and program SLOs? If not, please explain why.

b. Have you shared your assessments or improvement plans with your department, program or advisory committee? If so, what actions resulted? If not, how do you plan to do so in the future?

c. Did any of section, course or program improvement plans indicate that your program would benefit from specific resources in order to support student learning and/or faculty development? If so, please explain.

d. In reviewing your outcomes and assessments have you identified any and all that indicate a modification should be made to the course outline, the student learning outcomes or the program outcomes? Please state what modifications you will be making.

e. Have all course outlines been reviewed within the last 5 years? If not, please explain the plan to bring course outlines up to date and include time-lines for the review and submission to AP&P.

Sample Form Completed

ASSESSMENT SCHEDULE

6 Year

Program:_____ page ____ of ____

Use one row for each course or program outcome

SLO	To be assessed in semester:	Assessment method (s)	Resources needed to conduct assessment	Individual responsible for Improvement Plan	Date to complete review
1.1 Using the rocket equation and mission parameters, students will determine the mass fraction and exit velocity of an ideal rocket	Fall 2011, Fall 2012, Fall 2013	Student answers on final exam scores will be graded anonymously by two RP instructors, on a scale of 1 to 5, using a predetermined rubric.		Joe Yi	February 15, following the final exam semester.
1.2 Given mission requirements, students will lead a brainstorm session to sketch out rocket design features	Spring 2012, Spring 2013, Spring 2014	The outside experts will use a scoring rubric to judge the team leader's performance. They will also provide a qualitative strengths and weaknesses analysis of the final design, which will be a team grade.	May need room and meals for judge training.	Vesuvious McNuttal	May 15 of the semester when the judging takes place.

*This document is not in this packet, but can be found, if completed, on the Program Matrix (linked to the left). If not complete, a blank form can be found on the Student Learning Outcomes myHancock portal.

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Mathematics >> MATH123 - Fall 2017					
What did the assessment data indicate about the strengths of your course?	No action type	Anonymous	The assessment data showed that (of the teacher who entered data), 81.47% of their students met or exceeded the standard. Since our goal is 70%, we were well above the goal. Almost every teacher who responded, stated that students demonstrated an understanding of hypothesis testing. Several teachers commented that the standards were efficiently taught, that students understood key points, and that only minor mistakes	2018-02-05	
What did the assessment data indicate about the weaknesses of your course?	No action type	Anonymous	The comments on the weaknesses of the course were varied according to the responding teachers. Some of the teachers mentioned that their students mixed up the order of operations, mixed up their inequality symbols when comparing the standardized test statistic to the critical value, mixed up the way to verify normality on a 2 sample proportion hypothesis test with a 2 sample proportion confidence interval. One teacher mentioned that 1/3 of their class was not able to fully complete the hypothesis test question. Other teachers mentioned that students were unable to retain knowledge of hypothesis tests for the final exam and did not verify their answers	2018-02-05	

*This section from the this document is under the "Action Plan". This sub-section contains any "Course Improvement Plan" that has been written for this course. If there is no text, then there was no Improvement plan submitted on eLumen. It will also have any resource requests that were entered into eLumen.

Assessments

Summer 2017

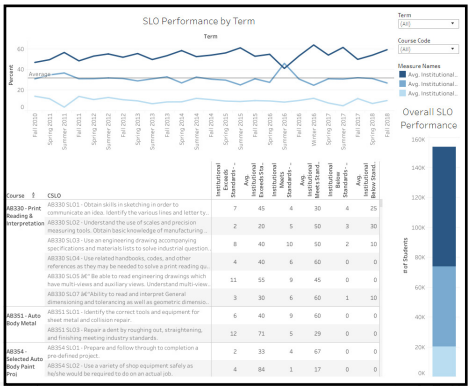
Grammar and Vocabulary Test

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
SPAN101 SLO1 - Use grammar and vocabulary at the appropriate level.	21 of 87	10	2	6	3

Grammar and Vocabulary Test

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
SPAN101 SLO1 - Use grammar and vocabulary at the appropriate level.	19 of 87	3	8	5	3

*This section from the this document is under the heading "Assessments contains all of the outcomes that were measured and indicate performance. Below, you can find the dashboard with SLO performance by outcomes. You can filter based on outcome, discipline, and term. You can use the "Snipping Tool" to add any visual charts to your update. Also, you can use the data to make conclusions about assessment practices.



Context Statistics And Evidence

Chemistry

Date: 02/28/2019

Terms Spring 2018, Fall 2017, Summer 2017

Summary

Statistic	Number of Courses	Courses
Courses in the Department	7	CHEM110, CHEM120, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses with CSLOs	7	CHEM110, CHEM120, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses without CSLOs	0	
Courses with CSLOs mapped to PSLOs	7	CHEM110, CHEM120, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses without CSLOs mapped to PSLOs	0	
Courses with direct assessment of PSLOs	0	
Courses with CSLOs mapped to ILOs	7	CHEM110, CHEM120, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses without CSLOs mapped to ILOs	0	
Courses with direct assessment of ILOs	0	
Courses with at least one planned Assessment	3	CHEM120, CHEM150, CHEM151
Courses with planned Assessments scored	2	CHEM150, CHEM151
Courses with some Assessments scored	1	CHEM120
Courses without any Assessment scored	0	
Courses with no planned Assessments	4	CHEM110, CHEM140, CHEM180, CHEM181
Courses with at least one planned Action Plan	7	CHEM110, CHEM120, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses with Action Plan Responses	0	
Courses with some Action Plan Responses	0	
Courses without Action Plan Responses	7	CHEM120, CHEM110, CHEM140, CHEM150, CHEM151, CHEM180, CHEM181
Courses with no planned Action Plans	0	

CHEM110 - Chemistry and Society

SLOs

CSLOs	» CHEM110 SLO1 - Describe the structure and composition of matter and its relationship to the macroscopic properties of substances. » CHEM110 SLO2 - Describe the nature and characteristics of chemical reactions. » CHEM110 SLO3 - Apply their knowledge of chemistry to analyze current science and technological development including its risks and benefits. » CHEM110 SLO4 - Describe the structure and functions of organic compounds, acids and bases. » CHEM110 SLO5 - Demonstrate proficiency with basic chemistry apparatus and analyzing data from experiments.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - Course doesn't map to a degree or certificate.
Mapped ILOs	**ILO** ILO 5 - Quantitative Literacy » ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems.

	ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges.

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM110 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM110 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM110 - Spring 2018					

CHEM120 - Introductory Chemistry

SLOs

CSLOs	» CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis. » CHEM120 SLO2 - Write formulas and names of simple compounds and ions. » CHEM120 SLO3 - Solve problems related to chemical equations and density. » CHEM120 SLO4 - Define and give examples of chemical terms. » CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - Course doesn't map to a degree or certificate.
Mapped ILOs	**ILO** ILO 5 - Quantitative Literacy » ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems. ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Assessments

Summer 2017

SLO#1

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	18 of 151	16	1	1	0

SLO5 use la apparatus accuratel;y and prercisely

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.	28 of 151	22	4	1	1

SLO5 use lab apparatus accurately & precisely

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.	28 of 151	19	6	0	3

Spring 2018

CHEM120

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A

CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	0 of 254	0	0	0	0
CHEM120 SLO2 - Write formulas and names of simple compounds and ions.	0 of 254	0	0	0	0
CHEM120 SLO3 - Solve problems related to chemical equations and density.	0 of 254	0	0	0	0
CHEM120 SLO4 - Define and give examples of chemical terms.	0 of 254	0	0	0	0
CHEM120 SLO5 - Able to use the appropriate laboratory apparatus to perform accurate & precise measurements.	0 of 254	0	0	0	0

SLO#1

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM120 SLO1 - Use scientific notation, significant figures, and dimensional analysis.	23 of 254	14	7	0	2

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM120 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM120 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM120 - Spring 2018					

CHEM140 - Intro Organic Chemistry

SLOs

CSLOs	» CHEM140 SLO1 - Write, name and formula of organic compounds. » CHEM140 SLO2 - Identify the chemical properties and hazards of the common classes of organic compounds. » CHEM140 SLO3 - Demonstrate the common means of identifying chemical compounds and have a working knowledge of the various instrumental analytical techniques. » CHEM140 SLO4 - Demonstrate the mechanisms by which the common addition and substitution reactions take place.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - Course doesn't map to a degree or certificate.
Mapped ILOs	**ILO** ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM140 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM140 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request

CHEM150 - General Chemistry 1

SLOs

CSLOs	» CHEM150 SLO1 - Perform stoichiometric calculations. » CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction. » CHEM150 SLO3 - Solve questions involving gas laws » CHEM150 SLO4 - Provide the quantum numbers for any specific electron. » CHEM150 SLO5 - Perform calculations involving thermodynamics. » CHEM150 SLO6 - Perform laboratory quantitative analysis.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - The student will demonstrate mastery of the approach and rationale of the scientific method and be able to apply these principles to solve problems. » CHEM PSLO - The student will demonstrate mastery of stoichiometric calculations. » CHEM PSLO - The student will demonstrate mastery of laboratory technique.
Mapped ILOs	**ILO** ILO 5 - Quantitative Literacy » ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems. ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Assessments

Fall 2017

CHEM150_ALLSLOS_SMG_F2017

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO1 - Perform stoichiometric calculations.	42 of 151	3	28	11	0
CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	42 of 151	9	22	11	0
CHEM150 SLO3 - Solve questions involving gas laws	42 of 151	5	33	4	0
CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	42 of 151	15	12	15	0
CHEM150 SLO5 - Perform calculations involving thermodynamics.	42 of 151	1	25	16	0

All SLOs

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO1 - Perform stoichiometric calculations.	17 of 151	2	12	3	0
CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	17 of 151	2	11	4	0
CHEM150 SLO3 - Solve questions involving gas laws	17 of 151	2	10	5	0
CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	17 of 151	2	5	10	0
CHEM150 SLO5 - Perform calculations involving thermodynamics.	17 of 151	2	5	10	0
CHEM150 SLO6 - Perform laboratory quantitative analysis.	17 of 151	2	3	12	0

SLO2 Balance Redox

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	30 of 151	18	6	4	2

SLO2 Balance Redox

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	31 of 151	18	10	3	0

SLO2 Balance Redox

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO2 - Balance chemical equations, including oxidation-reduction.	31 of 151	13	11	7	0

Spring 2018

gas law

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO3 - Solve questions involving gas laws	27 of 94	9	11	5	2

SLO4 - quantum numbers

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM150 SLO4 - Provide the quantum numbers for any specific electron.	29 of 94	7	16	4	2

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM150 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM150 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM150 - Spring 2018					

CHEM151 - General Chemistry 2

SLOs

CSLOs	» CHEM151 SLO1 - Perform kinetic calculations. » CHEM151 SLO2 - Perform equilibrium calculations. » CHEM151 SLO3 - Perform thermodynamic calculations. » CHEM151 SLO4 - Define and explain concepts of equilibria. » CHEM151 SLO5 - Interpret a pH graph from an acid-base titration. » CHEM151 SLO6 - Perform qualitative analysis.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - The student will demonstrate mastery of the approach and rationale of the scientific method and be able to apply these principles to solve problems. » CHEM PSLO - The student will demonstrate mastery of stoichiometric calculations. » CHEM PSLO - The student will demonstrate mastery of laboratory technique.
Mapped ILOs	**ILO** ILO 5 - Quantitative Literacy » ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems. ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Assessments

Fall 2017

SLO 2

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM151 SLO2 - Perform equilibrium calculations.	24 of 24	6	4	14	0

Spring 2018

SLO3 - Perform thermodynamic calculations

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM151 SLO3 - Perform thermodynamic calculations.	28 of 92	10	10	6	2

SLO3 - thermodynamic calculations

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM151 SLO3 - Perform thermodynamic calculations.	28 of 92	12	8	7	1

SLO3 - thermodynamic calculations

SLO	Scored	Institutional Exceeds Standards	Institutional Meets Standards	Institutional Below Standards	N/A
CHEM151 SLO3 - Perform thermodynamic calculations.	29 of 92	8	11	9	1

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM151 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM151 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM151 - Spring 2018					

CHEM180 - Organic Chemistry I

SLOs

CSLOs	» CHEM180 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure. » CHEM180 SLO2 - Define structures of alcohols, alkyl halides, and hydrocarbons and be able to draw the condensed and line-bond formulas (Kekulé structures). » CHEM180 SLO3 - Determine reaction mechanisms and propose synthesis routes for organic reactions to be carried out in the laboratory. » CHEM180 SLO4 - Identify compounds through the use of chromatography, refractometry, polarimetry, and IR, MS, and NMR spectroscopy. » CHEM180 SLO5 - Synthesize and purify compounds utilizing crystallization, sublimation, and distillation through macro- and micro-scale procedures.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - The student will demonstrate mastery of the approach and rationale of the scientific method and be able to apply these principles to solve problems. » CHEM PSLO - The student will demonstrate mastery of laboratory technique.
Mapped ILOs	**ILO** ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM180 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request

Allan Hancock College >> Chemistry >> CHEM180 - Spring 2018

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM180 - Spring 2018					

CHEM181 - Organic Chemistry II

SLOs

CSLOs	» CHEM181 SLO1 - Make predictions on physical properties and chemical reactivity based on molecular structure. » CHEM181 SLO2 - Define structures of aldehydes, amides, amines, carboxylic acids, esters, and ketones and be able to draw the condensed and line-bond formulas (Kekulé structures). » CHEM181 SLO3 - Determine reaction mechanisms and propose synthesis routes for organic reactions to be carried out in the laboratory. » CHEM181 SLO4 - Identify compounds through the use of chromatography, IR, NMR, and UV-spectroscopy. » CHEM181 SLO5 - Synthesize and purify compounds utilizing crystallization, sublimation, and distillation through macro- and micro-scale procedures. » CHEM181 SLO6 - Relate functional groups to carbohydrate, lipid, nucleic acid, and prote classification and structure.
Mapped PSLOs	**Chemistry Program Outcomes** Chemistry Program Outcomes » CHEM PSLO - The student will demonstrate mastery of the approach and rationale of the scientific method and be able to apply these principles to solve problems. » CHEM PSLO - The student will demonstrate mastery of laboratory technique.
Mapped ILOs	**ILO** ILO 6 - Scientific Literacy » ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potentia solutions to real-life challenges. ILO 2 - Critical Thinking & Problem Solving » ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Action Plans

Fall 2017

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM181 - Fall 2017					

Spring 2018

2017 Context Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM181 - Spring 2018					

2017 Course Improvement Plan

Expected Action	Action Type	Respondent	Action Taken	Date	Resource Request
Allan Hancock College >> Chemistry >> CHEM181 - Spring 2018					

Chemistry Program Review Review of Prerequisites, Corequisites, and Advisories – Summary

PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 120 (Introductory Chemistry)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: MATH309 or MATH311 (Algebra I)

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU Sacramento	CHEM 6A Introduction to Gen. Chemistry	one year of high school algebra
CSU Fullerton	CHEM 100 Survey of Chemistry	one year of high school algebra
CSU LA	CHEM 151 Fundamentals of Chemistry	one year of high school algebra

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/9/2022 ~~2021~~
Initiator Date

Ashley Wise 9/21/2022 2021
Department Chair Date

Approved:
Academic Dean 9/20/2022 Date

Completed forms and all backup documentation should be maintained at the department. Transfer conclusion information to the Program Evaluation PCA Summary Report.

PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 140 (Introductory Organic and Biological Chemistry)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: CHEM 120 (Introductory Chemistry

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU San Diego	CHEM 130 Elementary Organic Chemistry	Chemistry 100 or 200
CSU Fresno	CHEM 3B Introductory Organic and Biochemistry	CHEM 3A
CSU San Bernadino	CHEM 206 Fundamentals of Chemistry II	CHEM 205 or CHEM 215

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/22 ~~2021~~
Initiator Date

Ashley Wise 9/21/2022 2021
Department Chair Date

Approved:

Academic Dean 9/20/2022
Date

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PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 150 (General Chemistry 1)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: CHEM 120 (Introductory Chemistry

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU Domingues Hills	CHE 110 General Chemistry I	CHE 108 Introduction to College Chemistry
CSU Bakersfield	CHEM 211 Principles of General Chemistry	CHEM 101 Preparation for College Chemistry
CSU Channel Islands	CHEM 121 General Chemistry I	CHEM 105 Introduction to Chemistry

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/2022
~~2021~~
Initiator Date

Ashley Wise 9/21/2022
~~2021~~
Department Chair Date

Approved: 9/20/2022
Academic Dean Date

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PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 150 (General Chemistry 1)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: **AND** MATH331 (Algebra 2)

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU Sacramento	CHEM 1A General Chemistry	High school algebra (two years)
CSU Bakersfield	CHEM 211 Principles of General Chemistry	Math 85 Developmental Mathematics II
CSU LA	CHEM 101 General Chemistry I	two years of high school algebra

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/2022
~~2021~~
Initiator Date

Ashley Wise ~~2021~~ 9/21/2022
Department Chair Date

Approved: 9/20/2022
Academic Dean Date

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PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 151 General Chemistry 2)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: CHEM 150 (General Chemistry 1)

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
UC Berkley	Chemistry 1B General Chemistry	Chemistry 1A/1AL General Chemistry
CSU Channel Islands	Chem 122 General Chemistry	Chem 121 General Chemistry
CSU Sacramento	Chem 1B General Chemistry II	Chem 1A General Chemistry 1

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/2022 ~~2021~~
Initiator Date

Ashley Wise 2021 9/21/2022
Department Chair Date

Approved: 9/20/2022
Academic Dean Date

Completed forms and all backup documentation should be maintained at the department. Transfer conclusion information to the Program Evaluation PCA Summary Report.

PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 180 (Organic Chemistry 1)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: CHEM 151 (General Chemistry 2)

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU Fresno	Chemistry 128A Organic Chemistry	Chemistry 1B
CSU Channel Islands	Chem 311/312 Organic Chemistry I & I L	Chem 122 General Chemistry
CSU Sacramento	Chem 24/25 Organic Chemistry I & I L	Chem 1B

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/22 ~~2021~~
Initiator Date

Ashley Wise 9/21/2022 ~~2021~~
Department Chair Date

Approved: 9/20/2022
Academic Dean Date

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PREREQUISITES, COREQUISITES, ADVISORIES

UC/CSU COMPARISON SHEET

Course Prefix and Number CHEM 181 (Organic Chemistry 2)

Department Life and Phyiscal Sciences Responsible Instructor Dustin Nouri

Prerequisite being reviewed: CHEM 180 (Organic Chemistry 1)

Use one form for each prerequisite/corequisite/advisory if the course has more than one

The following UC or CSU campus offers the same course and is identified as:

Institution	Name of Parallel Course	Prerequisite of Parallel Course
CSU Fresno	Chemistry 128B Organic Chemistry	Chemistry 128A
CSU Channel Islands	Chem 314/315 Organic Chemistry II & II L	Chem 311/312 Organic Chemistry I & I L
CSU Sacramento	Chem 124/125 Organic Chemistry II & II L	Chem 24/25 Organic Chemistry I & I L

The prerequisites at the above institutions are the same courses or the same experience (if a sequence is the stated prerequisite) as the Allan Hancock College prerequisite, and it is the recommendation of the faculty that the stated prerequisite be maintained.

Dustin Nouri 9/19/2022 ~~2021~~
Initiator Date

Ashley Wise ~~2021~~ 9/21/2022
Department Chair Date

Approved:
Academic Dean 9/20/2022
Date

Completed forms and all backup documentation should be maintained at the department. Transfer conclusion information to the Program Evaluation PCA Summary Report.

Chemistry Program Review Plan of Action – Pre-Validation

PLAN OF ACTION - PRE-VALIDATION
Six Year

DEPARTMENT: Life and Physical Sciences PROGRAM: CHEMISTRY

List below as specifically as possible the actions which the department plans to take as a result of this program review. Be sure to address any problem areas which you have discovered in your analysis of the program. Number each element of your plans separately and for each, please include a target date. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan. (See Institutional Goals and Objectives)

RECOMMENDATIONS TO IMPROVE **STUDENT LEARNING OUTCOMES** AND ACHIEVMENT	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
1) The chemistry faculty will continue to support the MESA and STEM programs as well as the Learning Resource Center at the Santa Maria and Lompoc Valley Center campuses to help inform students of their support services. The faculty will continue to promote high academic standards and success in achieving Program Learning Outcomes so that our students may thrive once they have moved on to the next stage of their academic careers.	1) A.1/A.7/B.7/C.7.	1) ONGOING
2) The chemistry faculty will continue to remain current in the latest chemistry literature and useful technology to help convey the material at the appropriate undergraduate level.	2) B.7.	2) ONGOING
3) The full-time chemistry faculty will work with the Union and current contracts to help ensure the adjunct-faculty are properly compensated for the additional work associated with inputting Program Learning Outcome data.	3) B.7.	3) ONGOING

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Enrollment Changes The chemistry curriculum sections are growing and expanding. Additional lab space is being required at both campuses over the next program cycle. LVC has begun looking into converting LVC3-109 into a science lab. As they currently only have one functioning chemistry lab, this will help free up LVC3-102 for evening course offerings. The SM campus will likely look into M-212 since that lab has fume-hoods. Lab benches and gas lines will need to be run to make the room fully functional.	A.2/B.4/D.5	ONGOING
Demographic Changes The chemistry program will continue to consider accommodations for student whom cannot attend day time classes. We need to expand LVC offerings and evening sections. Outfitting lecture and lab rooms with Zoom equipment can help during challenging times.	A.3/D.5/D.7	ONGOING

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Curricular Changes The chemistry faculty are updating curriculum to better serve the needs of the students. Our CHEM140 course will be mapped to the C-ID CHM102 to help ease any transfer issues. Sections of this course may be expanded to the sister campus, LVC, as need grows.	B.8	ONGOING
Co-Curricular Changes A math review CANVAS course may need to be created to help our incoming students meet the Basic Math Skills they require to succeed.	B.8	ONGOING

Neighboring College and University Plans The chemistry faculty will continue to work with neighboring colleges and universities to ensure that courses articulate and topics are aligned.	C.3/C.8/D.6/E.3	ONGOING
Related Community Plans The chemistry faculty will continue to volunteer when asked as we have for science fairs, Friday Night Science, tours of our department, brining hand-on chemistry to other schools, and presenting professional development activities.	A.1/A.5/A.6/E.7/E.8	ONGOING

RECOMMENDATIONS THAT REQUIRE ADDITIONAL RESOURCES	Theme/Objective/ Strategy Number AHC from Strategic Plan	TARGET DATE
Facilities 1) Service the fume-hoods annually as Cal OSHA requires (Keenan). 2) LVC3-102, 3-114, 2-212, and 2-102 need smart podium upgrades. 3) Need new whiteboards for M205/M213 4) Need new projector screens for M205/M-213 5) LVC 3-102 requires new ballasts for lighting 6) Expansion into M212? ($235,000)	A.1/A.4/B.1/B.2/ B.3/E.1/E.2	1)ONGOING 2)FALL2023 3)FALL2025 4)SPRING2026 5) SPRING2023 6) SPRING2027
Equipment 1) SM Gloves ($10,000) LVC Gloves ($10,000) 2) SM Equipment under $500 ($4,000) + inflation ($1200) LVC Equipment under $500 ($3,000) + inflation ($1200) 3) SM Goggles ($12,000) LVC Goggles ($12,000) 4) SM Analytical Balance ($3,500) LVC 7 Analytical Balances ($42,000) 5) SM 16 Centrifuges ($38,400) 6) ChemDraw Software ($4,250) 7) SM Repairs ($500) LVC Repairs ($500) 8) LVC Water Bath ($900) 9) LVC Fume-hoods and gas lines for new chemistry lab (LVC3-109). 10) SM gas lines and lab benches/stools for new chemistry lab (M-212) 11) LVC MelTemp equipment for CHEM140 ($7200) 12) Student laptops at SM and LVC campuses need to be refreshed. 13) LVC 16 Stirrers ($5,400)	A.1/A.4/B.1/B.2/ B.3/D.6/D.7/E.1/ E.2	1) ONGOING 2) ONGOING 3) FALL2023 4) FALL2023 5) FALL2023-SPRING2024 6) FALL2025 7) ONGOING 8) FALL2022 9)FALL2024 10)FALL2026 11)FALL2027 12) ONGOING 13) FALL2023

Staffing 1) Need full-time chemists to help fill the demand and need of the current sections offered and expanding. 2) SM Chemistry and Biology Lab Associate Position (+$55,000) 3) LVC Chemistry and Biology Lab Associate Position (+$55,000)	A.1/A.4/B.1/B.2/ B.3/E.1/E.2	1) FALL2023 – FALL2025 2)SPRING2023 3)FALL2026

EXHIBITS

Student Data Summary

Student Data

Statistics

Articulation Status of Courses

Course Review Verification Sheets

STUDENT DATA SUMMARY

Data analysis is a critical component of program review. The three categories below should be used as guidelines in developing a summary of the student data.

State at least three positive factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

The vast majority of students surveyed were satisfied (most of those "highly satisfied") with the following:

- 77% somewhat or highly satisfied with the "quality of instruction within the program" (Q2.1)
- 72% somewhat or highly satisfied with the "contribution towards [their] intellectual goal" (Q2.5)
- 71% somewhat or highly satisfied with the "physical facilities and space (e.g., classrooms, labs)" (Q2.11)
- 74% somewhat or highly satisfied with the "instructional equipment (e.g., computers, lab equipment)" (Q2.12)

In addition, of the students surveyed, 59% agree that "[they] would recommend taking courses in Chemistry" (Q6.1)

State at least three negative factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

1) Survey Question #2.3: 16% of students surveyed are dissatisfied with the "advice about the program from counselors." 40% are neither satisfied nor dissatisfied, with only 44% being satisfied. **(Chemistry is a challenging course, and the workload is often underestimated by students and counselors. With several students skipping recommended/required prerequisites via appeals through counseling, students may end up feeling underprepared for the classes in which they enrolled. Better coordination between the program and counseling is needed to properly convey the workload of our courses to students. In addition, specialized counselors for the science majors may help.)**

2) Survey Question #2.8: only 28% of students surveyed are satisfied with "the availability of courses offered in the Chemistry program." 38% are somewhat satisfied, with 25% being neither satisfied nor dissatisfied, and the remaining 10% being dissatisfied. **(The demand from students for our courses has been increasing, while the availability of full-time faculty has not kept up. Future growth hires will likely help to staff more classes. However, the availability of lecture and lab space for additional classes is a more daunting hurdle to overcome. The possibility for remote options for some of our courses can also help to address our long waitlists.)**

3) Survey Question #2.14: only 31% of students surveyed are satisfied with "course assistance through tutorial services (e.g through the Tutorial Center, Math Lab, Writing Center)." 38% are somewhat satisfied, with 23% being neither satisfied nor dissatisfied, and the remaining 8% being dissatisfied. **(The new STEM center is well equipped to help chemistry students, with the**

recent purchase of new molecular model kits and textbook hardcopies for students to use/borrow. In addition, embedded tutors have been implemented into some CHEM150 sections, with students giving positive feedback. The larger issue may be that students are generally unaware of the tutorial services made available to them, and more effort should be expended by instructors to make students aware of those resources.)

State any other information (use responsive numbers) that you obtained from student data (e.g. focus groups, questionnaires, or SGIDs) that may be of special interest to the self study team. What planning implications will result from this information?

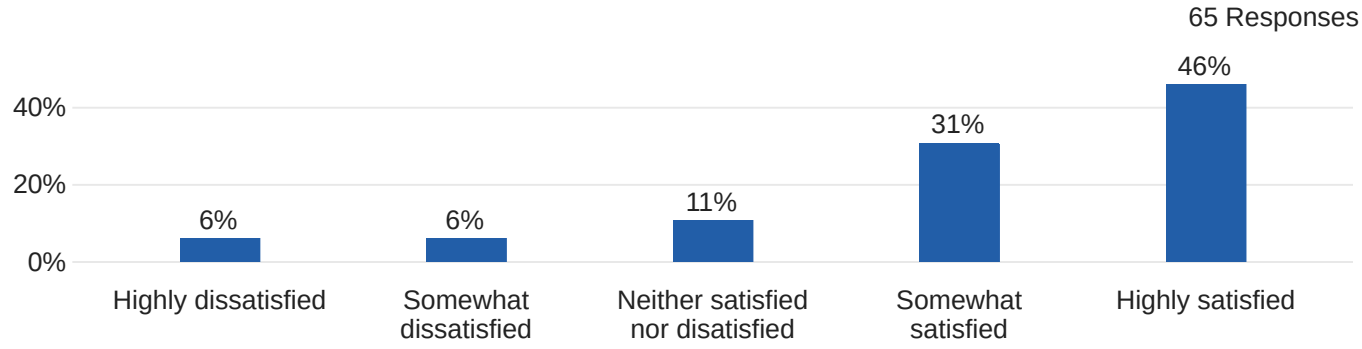
It should be noted that our available student survey data is limited. It would have been extremely helpful to compare data from before, during, and after the COVID lockdown. This would help pinpoint issues with in-person v. online learning of chemistry within our program.

It should also be noted that 50% of the students surveyed were full-time students (12+ units enrolled)(Q11), and 39% of surveyed students plan on taking additional courses in Chemistry (Q6.2), which means that a significant number of the surveyed students may major in chemistry or a related subject. This makes the values gleaned from this survey even more poignant.

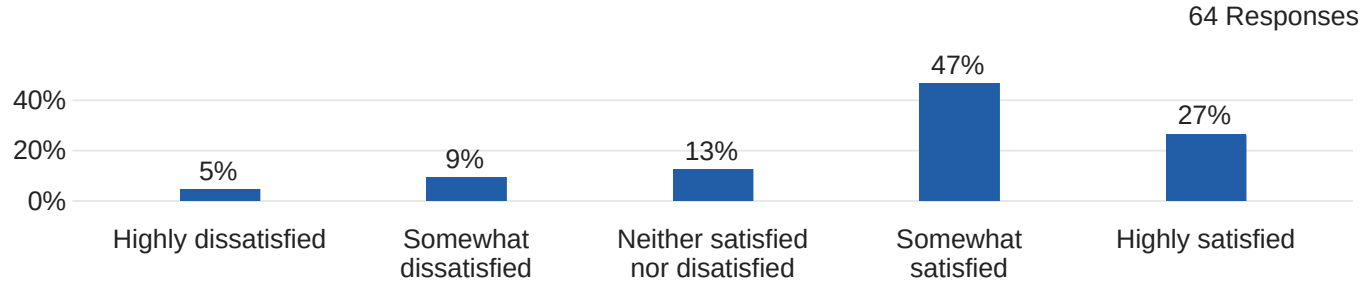
Chemistry
Fall 2021
Total Responses: 65

Please answer the following questions as they pertain to your experience in this course and all other courses in the Chemistry program at Allan Hancock College.

Q2_1 - Quality of instruction within the program

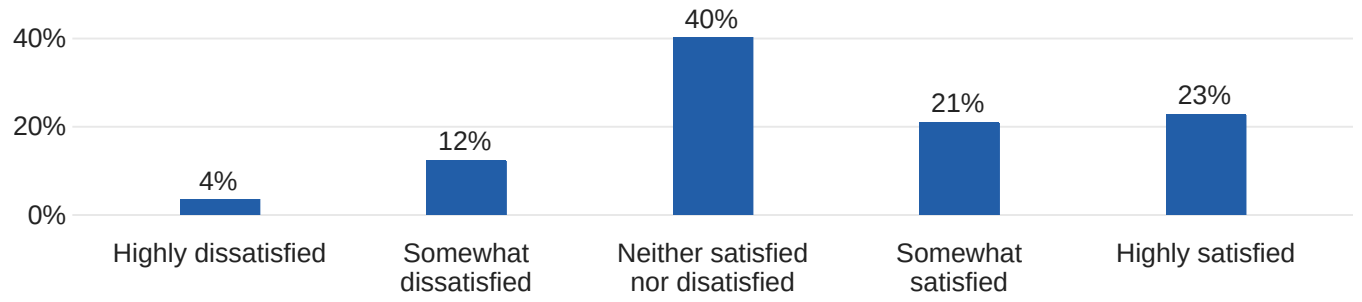


Q2_2 - The way textbooks and other materials used in courses within the program help me learn

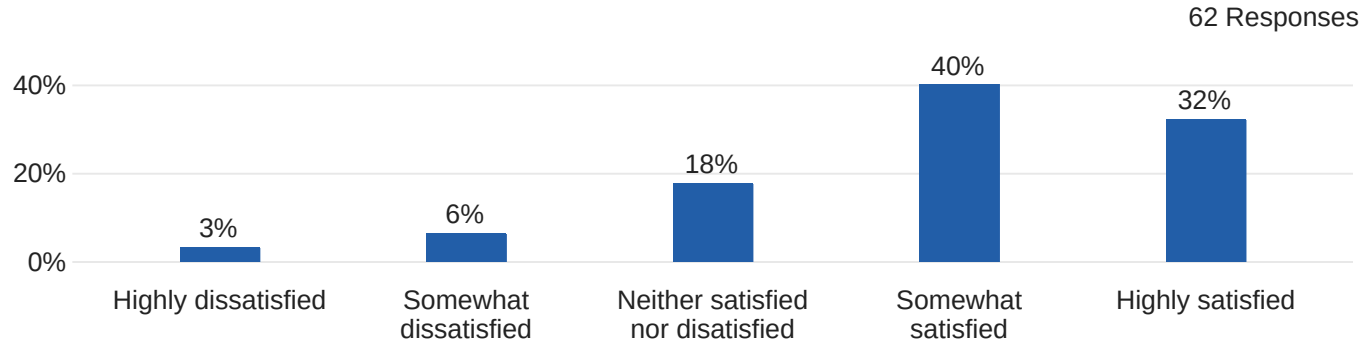


Q2_3 - Advice about the program from counselors

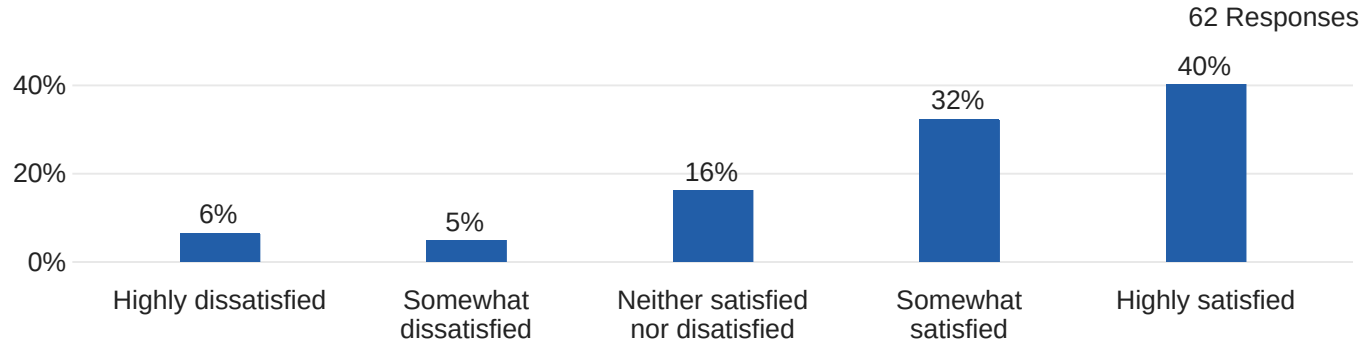
57 Responses



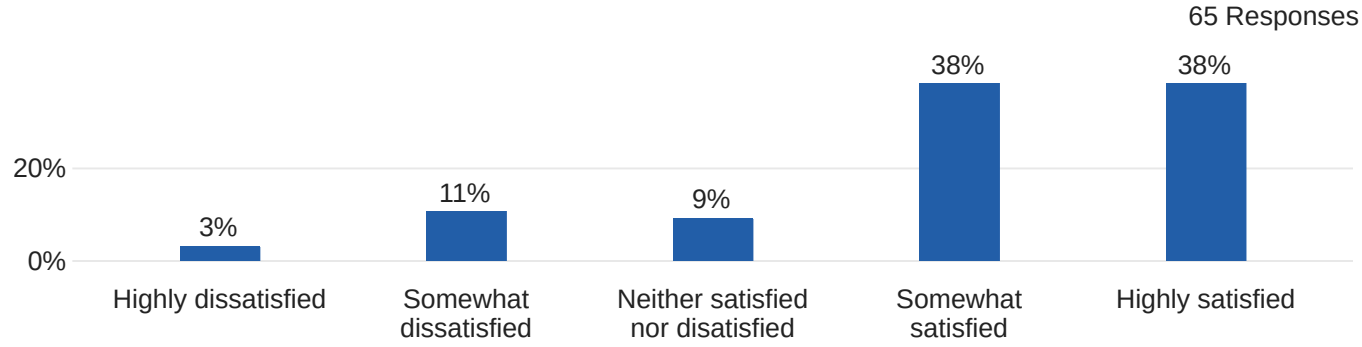
Q2_4 - The way this program meets your educational goals



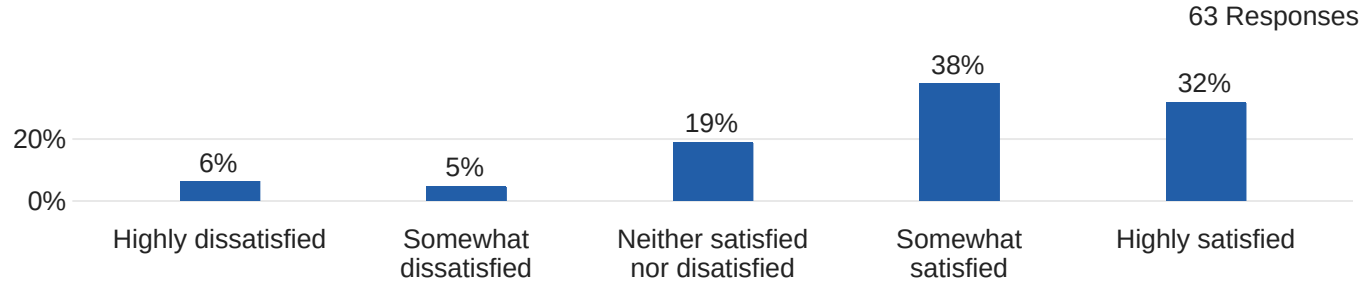
Q2_5 - Contribution towards your intellectual growth



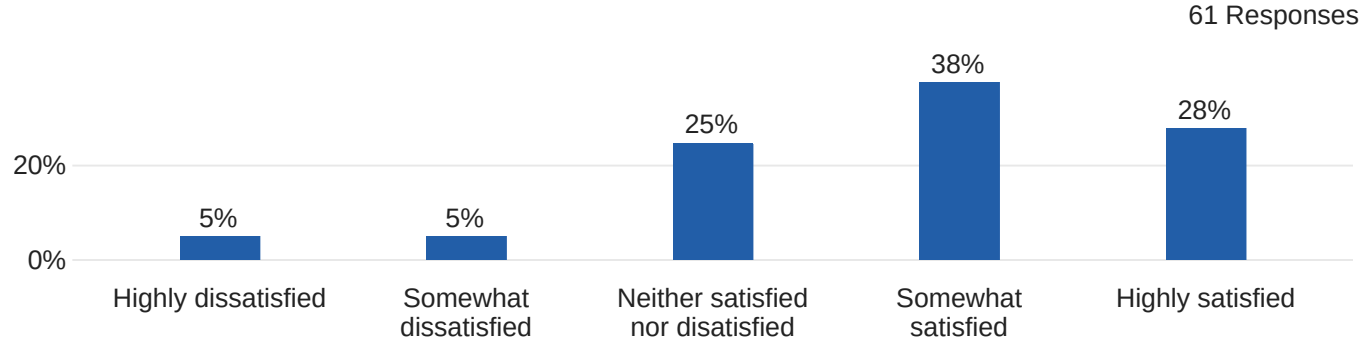
Q2_6 - Clarity of course goals and learning objectives



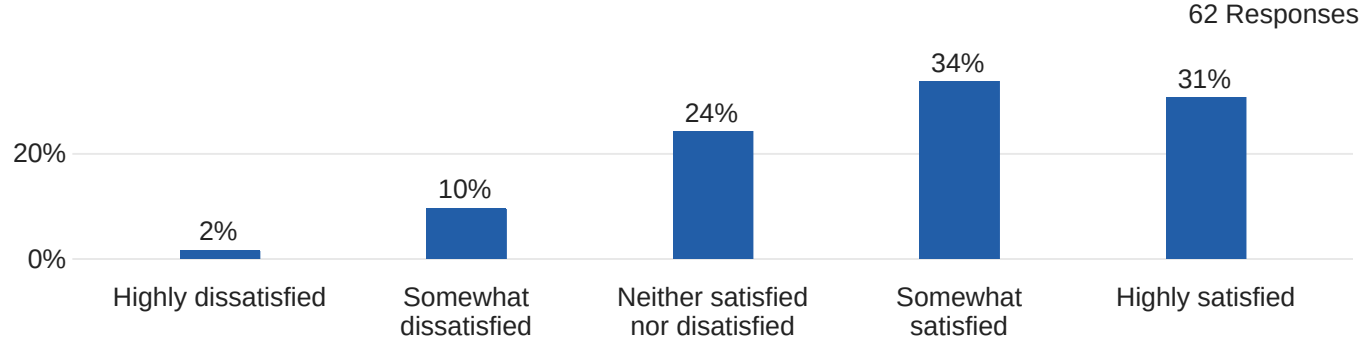
Q2_7 - Feedback and assessment of progress towards learning objectives



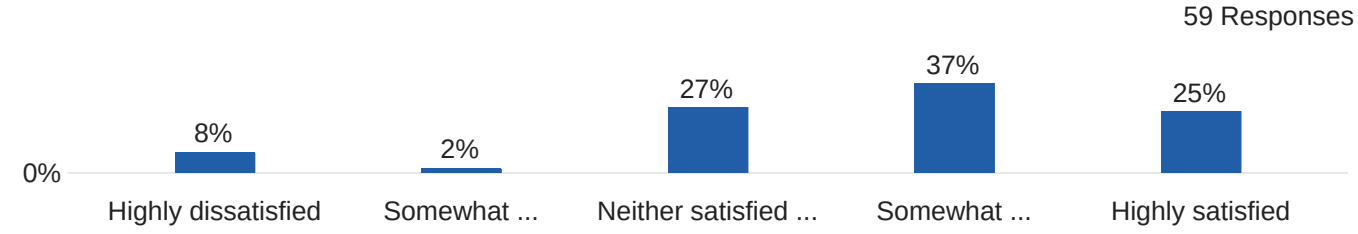
Q2_8 - The availability of courses offered in the Chemistry program



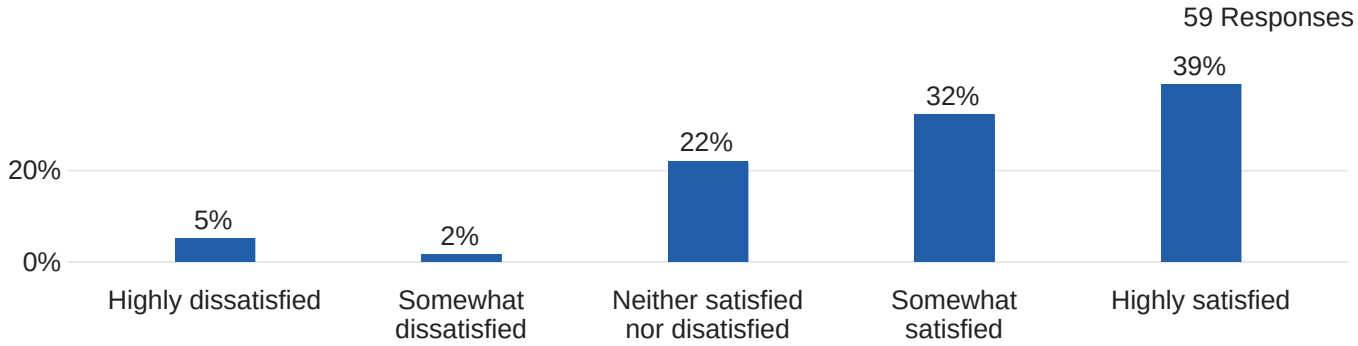
Q2_9 - The content of courses offered in the Chemistry program



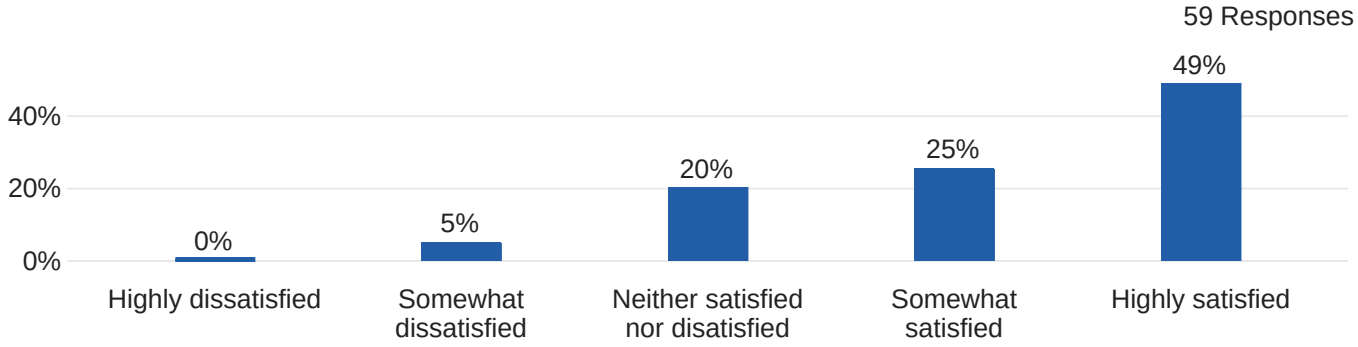
Q2_10 - The coordination of courses offered in the Chemistry program and courses offered in other departments that may be required for your major



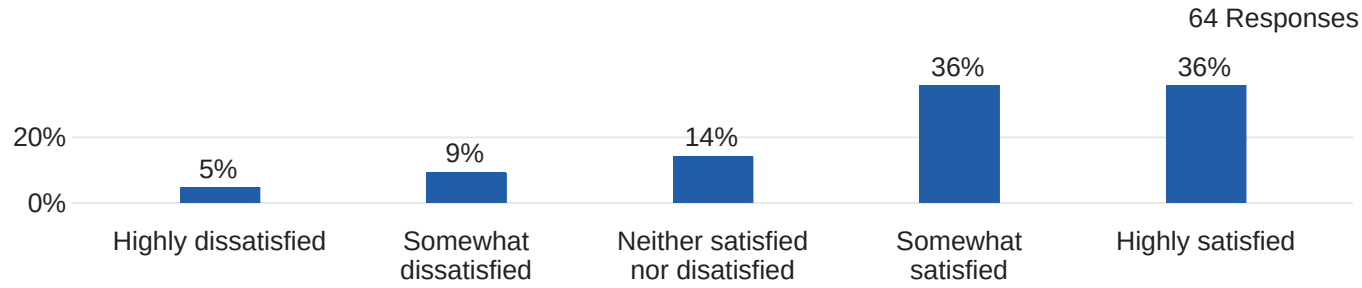
Q2_11 - The physical facilities and space (e.g., classrooms, labs)



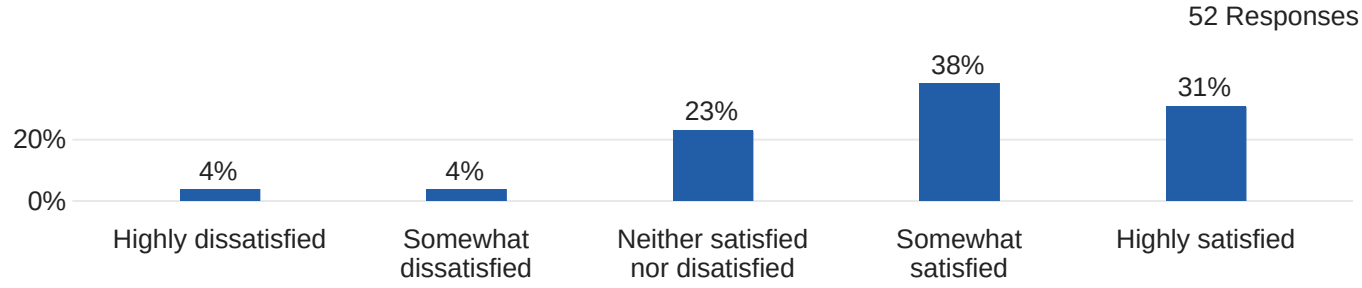
Q2_12 - Instructional equipment (e.g., computers, lab equipment)



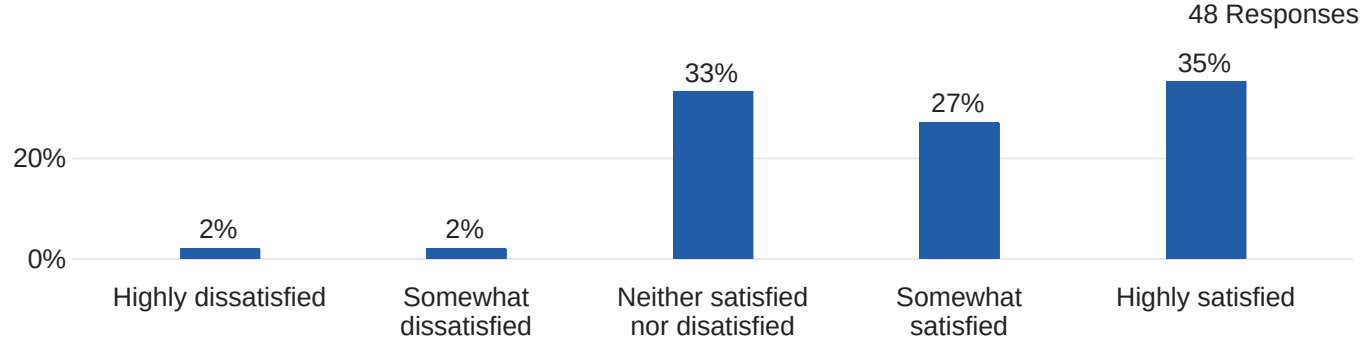
Q2_13 - Presentation of classes via the college’s Canvas course management system



Q2_14 - Course assistance through tutorial services (e.g through the Tutorial Center, Math Lab, Writing Center)



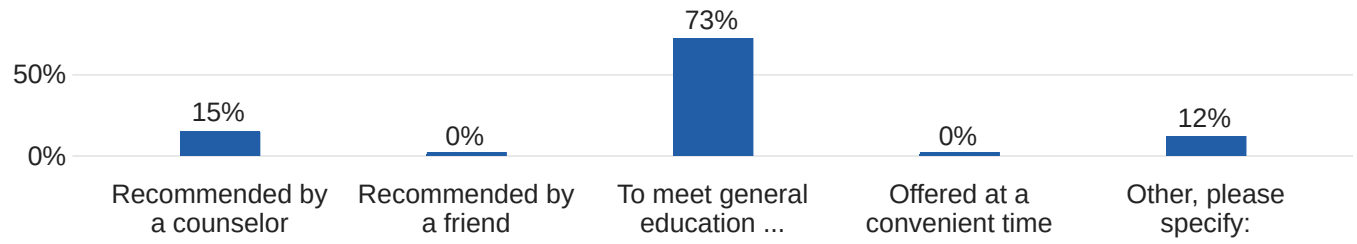
Q2_15 - Availability of appropriate resources in the libraries



Part II. Please answer the following questions about the Computer Business Information Systems (CBIS) program.

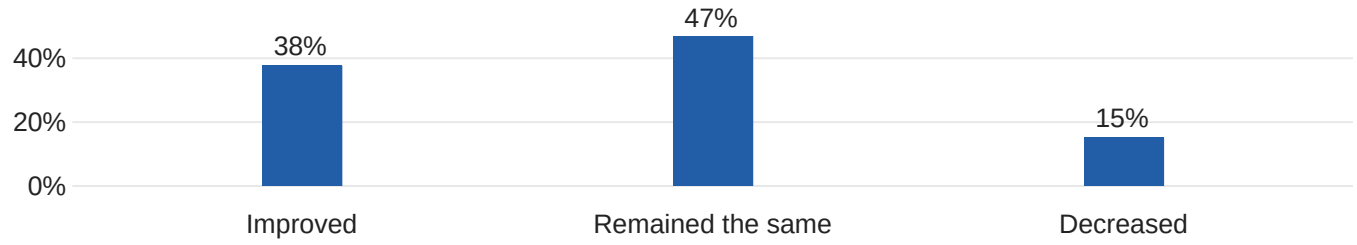
Q4 - Which of the following best describes your reason for taking this and other courses in Chemistry? - Selected Choice

66 Responses



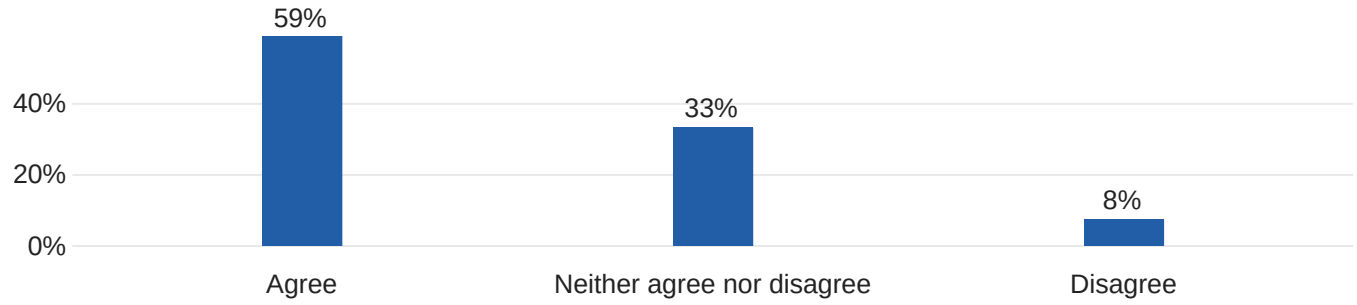
Q5 - Compared to the beginning of the semester, your attitude about Chemistry has...

66 Responses



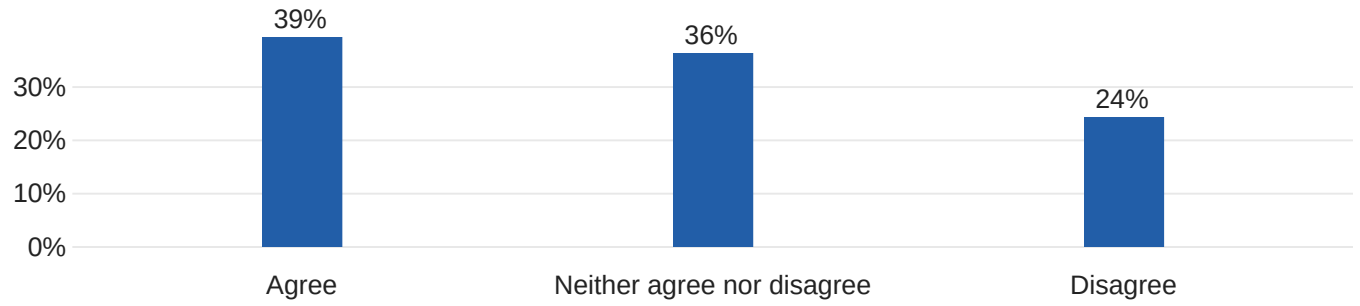
Q6_1 - I would recommend taking courses in Chemistry.

66 Responses



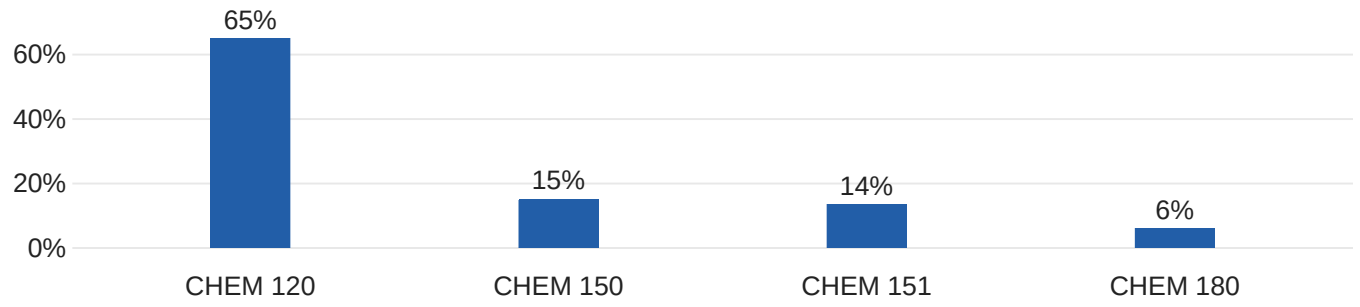
Q6_2 - I plan on taking additional courses in Chemistry.

66 Responses



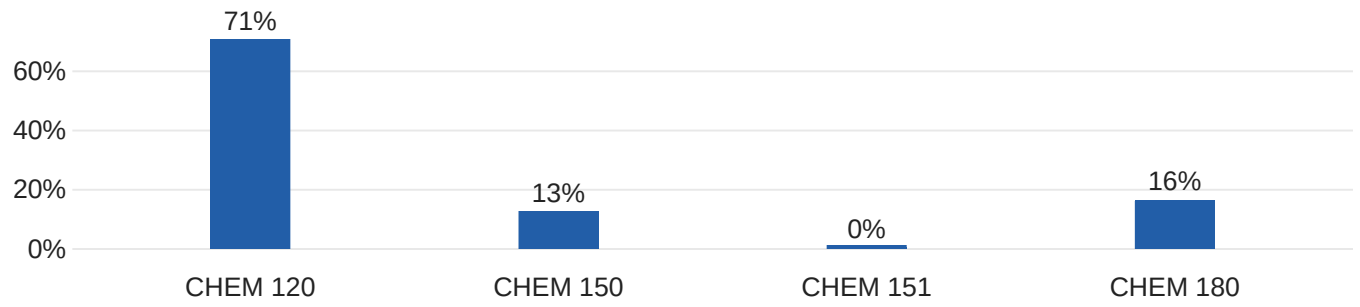
Q7 - Which of the following courses have you taken in Chemistry?

48 Responses



Q8 - Which courses are you taking this semester in Chemistry?

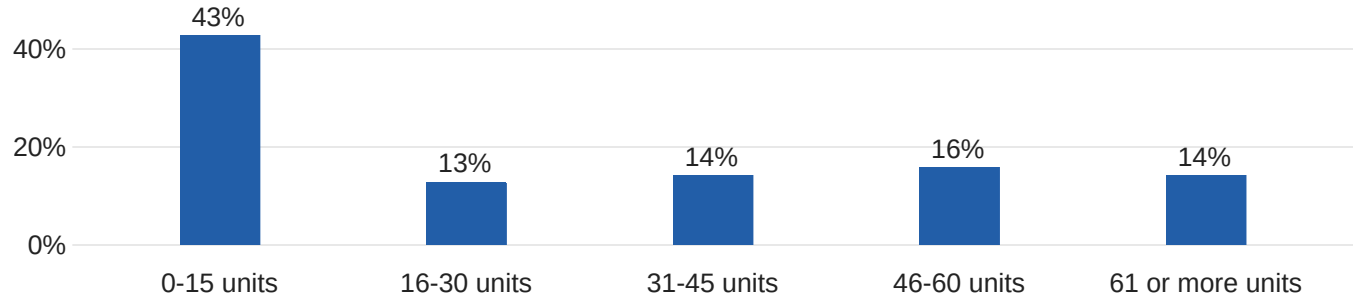
55 Responses



Part III. Background questions.

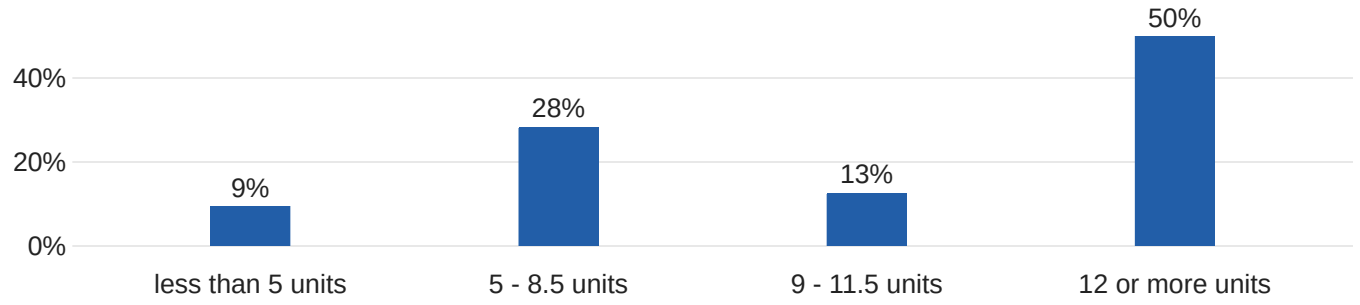
Q10 - How many units have you completed prior to this semester?

63 Responses



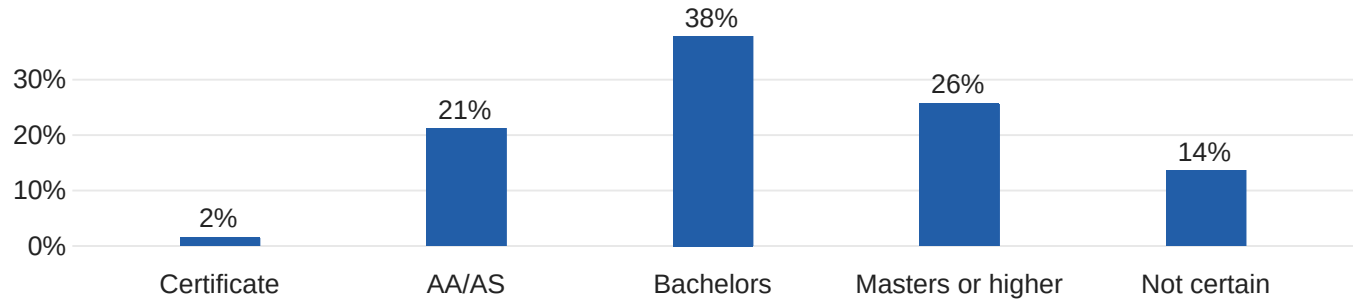
Q11 - In how many units are you currently enrolled?

64 Responses



Q12 - What is your final academic goal?

66 Responses



Program Data

STEP 1 | Choose subjects: CHEM

Subjects: CHEM

STEP 2 | Choose awards: Chemistry

Awards: Chemistry

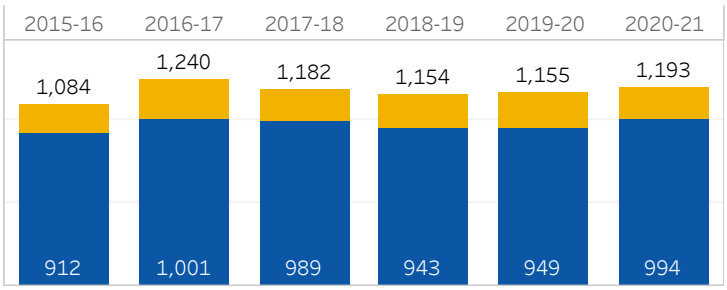
STEP 3 | Choose majors: Chemistry

Student Majors: Chemistry

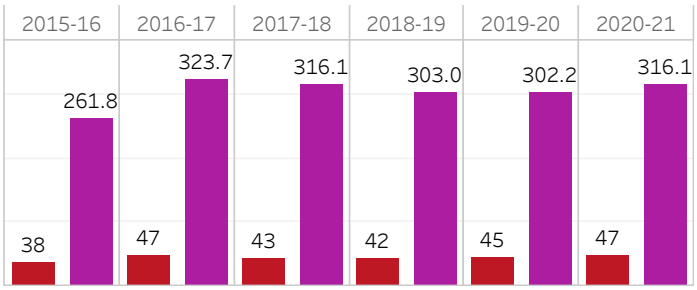
Contents

Quick Program Facts

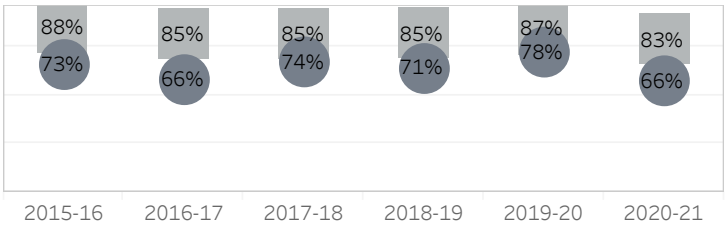
Headcount (undup)=Blue | Enrollment (dup)=Gold



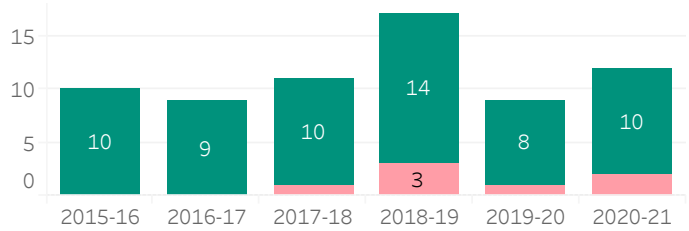
Sections=Red | FTES=Purple



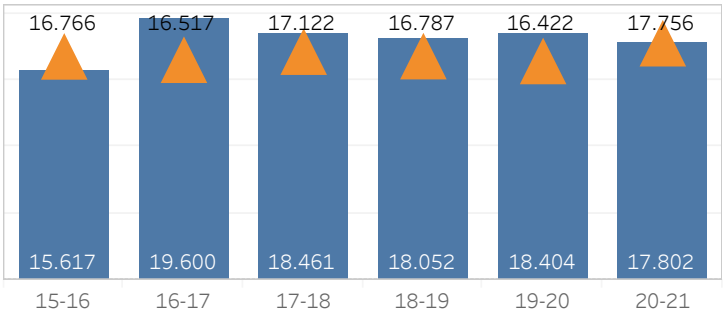
Retention=square | Success=circle



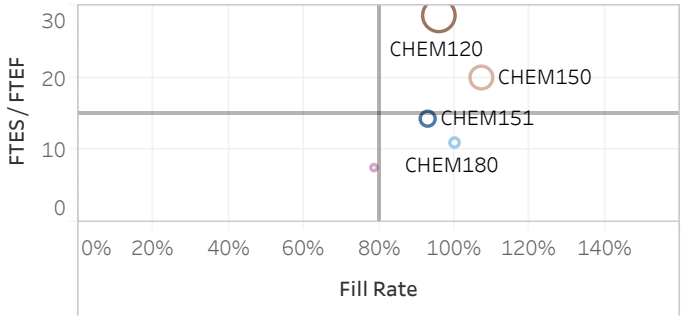
Credit Awards - Gold=Cert | Green=AA/AS / Pink=ADT



FTEF=Bar | FTES/FTEF=Triangle



Program Efficiency Fall 2020



Data Source: Student-MIS; Award, Major & Faculty-Banner | Headcount-unduplicated students; Enrollment-duplicated students; Retention-students who receive a grade in the course; Success-students who receive a passing grade in the course; FTES/FTEF target is 15+; Fill Rate target is 80%+

1 Outcomes CHEM

course_
All

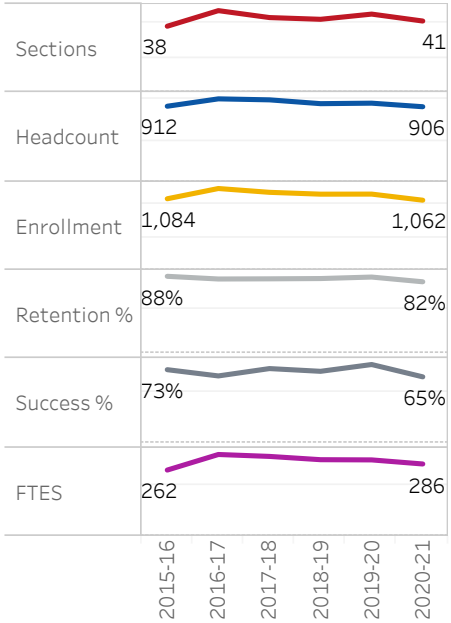
EW Grade
Exclude EW

	Sum 2014	Sum 2015	Fall 2015	Spring 2016	Sum 2016	Fall 2016	Spring 2017	Sum 2017	Fall 2017	Spring 2018	Sum 2018	Fall 2018	Spring 2019	Sum 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Sections	5	6	16	16	7	20	20	6	16	21	5	17	20	6	18	21	20	21
Headcount	131	156	455	470	165	528	532	159	459	563	132	477	544	139	497	516	536	525
Enrollment	131	156	455	473	177	528	535	159	459	564	132	477	545	139	497	519	536	526
retained	124	145	387	421	166	447	439	151	382	472	128	389	468	134	404	377	436	427
Retention %	95%	93%	85%	89%	94%	85%	82%	95%	83%	84%	97%	82%	86%	96%	82%	90%	81%	82%
success	119	138	291	357	160	344	318	136	325	409	120	314	384	120	340	356	329	362
Success %	91%	88%	64%	75%	90%	65%	59%	86%	71%	73%	91%	66%	70%	86%	69%	85%	61%	69%
FTES	25.8	31.1	109.7	121.1	34.3	138.6	150.8	32.5	138.0	145.7	27.1	128.2	147.8	27.9	135.6	138.7	141.2	144.8

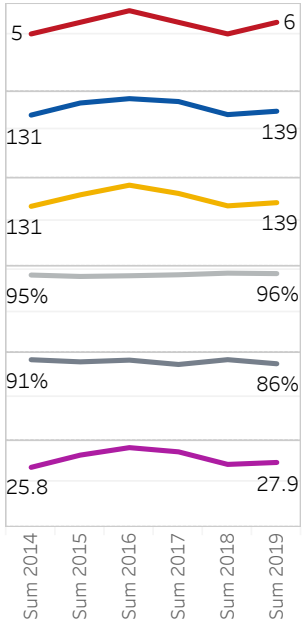
Outcomes Allan Hancock College Credit

	Sum 2015	Fall 2015	Winter 2016	Spring 2016	Sum 2016	Fall 2016	Winter 2017	Spring 2017	Sum 2017	Fall 2017	Winter 2018	Spring 2018	Sum 2018	Fall 2018	Winter 2019	Spring 2019	Sum 2019	Fall 2019	Spring 2020	Sum 2020	Fall 2020	Spring 2021
Sections	355	1,177	41	1,220	357	1,184	41	1,214	333	1,168	45	1,186	270	1,145	47	1,159	299	1,208	1,212	272	1,119	1,107
Headco..	5,593	10,982	1,051	11,341	4,354	12,111	1,023	11,636	5,306	11,889	1,118	11,320	4,596	11,380	1,171	10,580	4,940	12,091	11,342	4,633	10,462	10,076
Enrollm..	8,789	28,471	1,270	28,153	8,305	29,268	1,314	28,161	8,052	28,754	1,480	26,960	6,868	28,650	1,535	26,193	7,252	30,166	26,977	7,364	25,401	23,090
Retention %	90%	86%	84%	89%	90%	88%	87%	88%	90%	87%	87%	88%	90%	87%	88%	88%	92%	88%	92%	90%	88%	89%
Success %	77%	70%	71%	73%	80%	71%	77%	74%	80%	71%	79%	74%	80%	71%	79%	74%	81%	72%	85%	80%	72%	75%
FTES	1,009	3,807	111	3,715	967	4,197	115	4,020	900	4,126	139	3,869	835	4,061	169	3,827	846	4,136	3,763	827	3,531	3,231

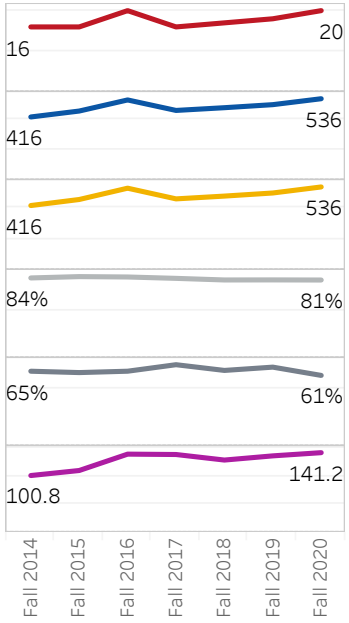
CHEM Academic Year



Summer Terms

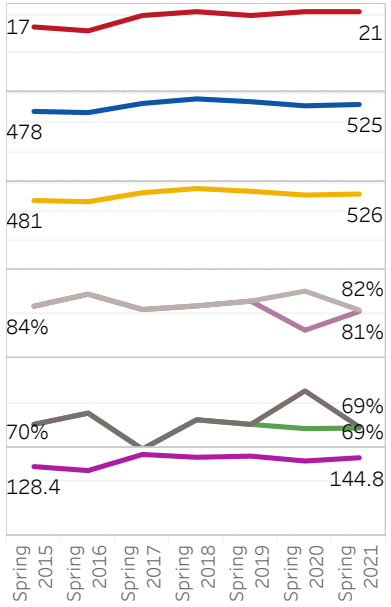


Fall Terms

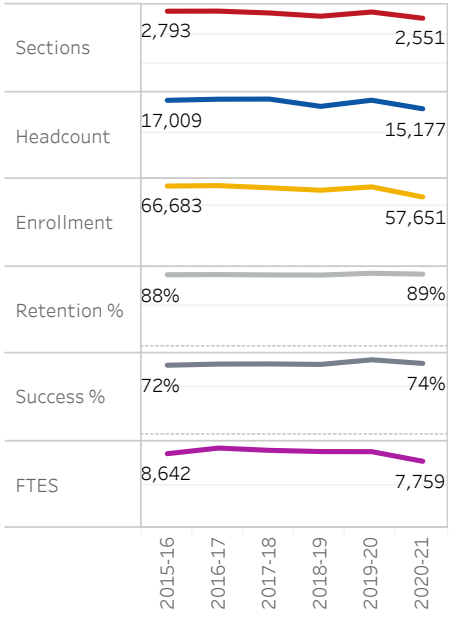


Winter Terms

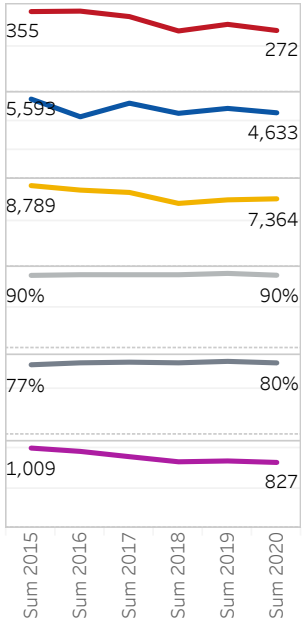
Spring Terms



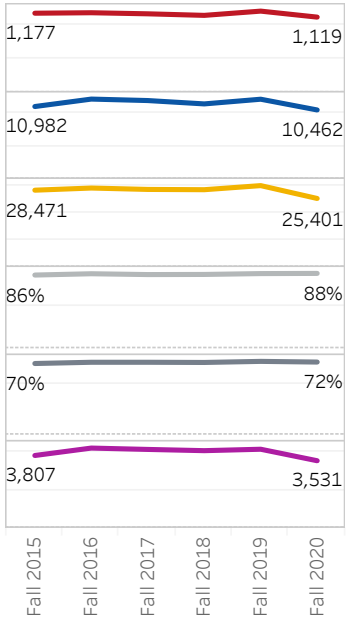
AHC Credit Academic Year



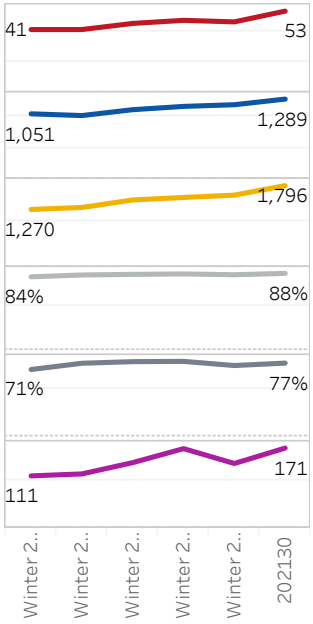
Summer Terms



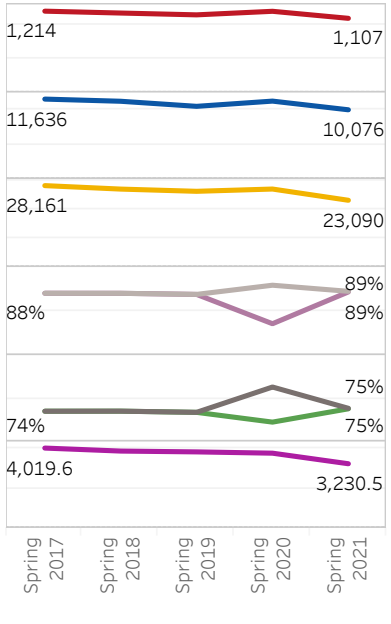
Fall Terms



Winter Terms



Spring Terms



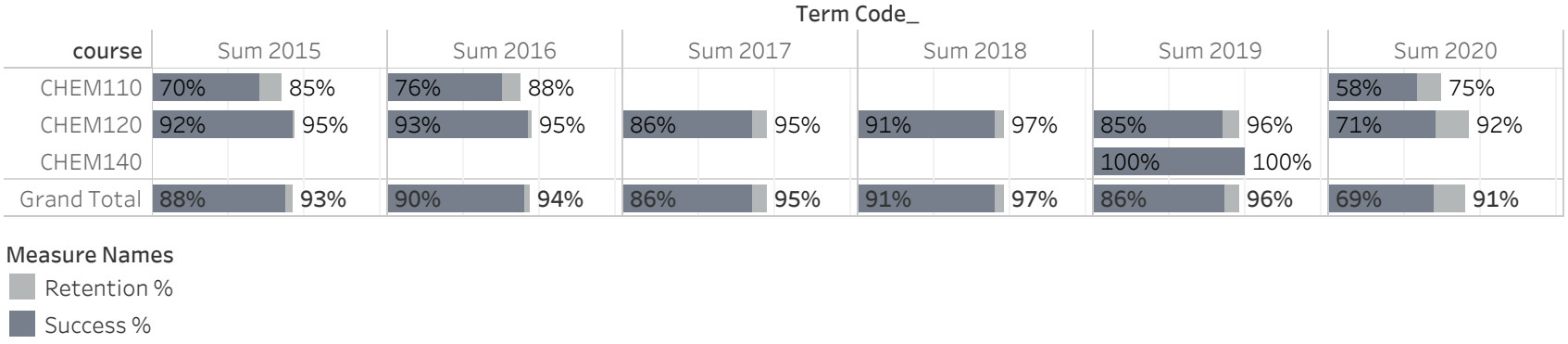
1 Retention & Success by academic year by course CHEM

course_	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
CHEM110	71% 88%	63% 84%	48% 81%		45% 71%	57% 74%
CHEM120	70% 88%	64% 85%	73% 86%	68% 86%	78% 88%	68% 85%
CHEM140	77% 80%	83% 90%	85% 89%	72% 72%	100% 100%	78% 86%
CHEM150	69% 85%	60% 79%	71% 81%	75% 87%	74% 83%	65% 80%
CHEM151	91% 95%	88% 93%	86% 90%	77% 85%	87% 92%	53% 74%
CHEM180		65% 78%	53% 68%	47% 58%	62% 67%	37% 58%
CHEM181		81% 94%	100% 100%	86% 86%	100% 100%	100% 100%
Grand Total	73% 88%	66% 85%	74% 85%	71% 85%	78% 87%	65% 82%

Retention % and Success % for each course_ broken down by Academic Year. Color shows details about Retention % and Success %. The data is filtered on TERM_CODE, CB04, subject and course. The TERM_CODE filter excludes 201510, 201520, 201540, 202110 and 202130. The CB04 filter keeps C, D and N. The subject filter keeps CHEM. The course filter has multiple members selected.

Measure Names
- Retention %
- Success %

1 Retention & Success by summer term by course CHEM



1 Retention & Success by fall term by course CHEM

course_	Fall 2015		Fall 2016		Fall 2017		Fall 2018		Fall 2019		Fall 2020	
CHEM110	70%	93%	58%	79%					35%	60%	41%	68%
CHEM120	51%	81%	60%	85%	66%	81%	62%	82%	70%	85%	66%	86%
CHEM150	90%	93%	74%	84%	79%	88%	77%	88%	71%	81%	63%	79%
CHEM151	69%	83%	78%	96%	76%	83%	40%	52%	71%	77%	48%	75%
CHEM180			65%	78%	53%	68%	47%	58%	62%	67%	37%	58%
Grand Total	64%	85%	65%	85%	71%	83%	66%	82%	69%	82%	61%	81%

Measure Names

- Retention %
- Success %

1 Retention & Success by spring term by course CHEM

course_	Spring 2016	Spring 2017	Spring 2018	Spring 2019	Spring 2020	Spring 2021
CHEM110	73% 85%	54% 83%	48% 81%		64% 91%	72% 80%
CHEM120	82% 94%	51% 81%	72% 86%	62% 84%	85% 88%	71% 84%
CHEM140	77% 80%	83% 90%	85% 89%	72% 72%	100% 100%	78% 86%
CHEM150	48% 77%	42% 73%	60% 71%	72% 87%	78% 86%	67% 80%
CHEM151	98% 99%	91% 92%	89% 92%	86% 93%	93% 97%	57% 74%
CHEM181		81% 94%	100% 100%	86% 86%	100% 100%	100% 100%
Grand Total	75% 89%	59% 82%	73% 84%	70% 86%	85% 90%	69% 82%

Measure Names

- Retention %
- Success %

2 Program Demographics CHEM

Choose individual course via filter or see Appendix A for full demographic course details

course_
All

Academic Year

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
Age Category	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Under 20	267	72.6	341	108.1	393	114.9	410	126.1	403	132.7	387	116.8
20-24	457	136.8	471	157.8	418	144.3	385	126.1	377	114.5	358	114.3
25-29	115	32.4	118	36.5	109	34.3	108	33.4	97	27.7	83	25.9
30-34	35	7.3	35	9.8	36	11.0	34	11.4	47	14.8	55	16.2
35-39	22	5.2	25	6.1	17	4.5	13	3.5	19	6.0	24	7.0
40-49	22	4.8	16	3.8	20	5.1	8	1.9	19	5.0	13	4.4
50+	11	2.7	5	1.7	8	2.0	3	0.6	7	1.6	3	1.3

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
ETHNICITY	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Asian	33	12.1	38	12.1	26	9.4	25	8.3	30	11.6	17	4.5
Black	16	3.8	18	5.6	19	6.4	16	5.3	16	5.0	21	6.6
Filipino	32	10.3	42	13.2	43	14.3	46	16.4	33	11.7	35	12.8
Hispanic	527	151.8	584	191.2	567	182.4	489	153.2	456	142.4	422	132.5
NativeAm	14	4.4	19	6.0	13	4.0	20	5.9	19	6.6	15	4.7
Other					1	0.2	1	0.2				
PacIsl	4	1.4	6	2.0	9	2.6	4	1.6	4	1.3	6	2.4
White	286	78.1	293	91.1	312	96.9	340	111.6	384	121.4	382	119.8

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Female	493	131.7	533	162.9	570	172.8	551	169.6	581	176.4	543	170.2
Male	419	130.1	464	157.2	417	142.8	387	132.3	358	122.8	342	108.7
Unknown			3	1.1	2	0.5	3	0.6	3	0.7	13	4.3

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
First Time	74	16.3	95	23.0	81	19.1	114	28.3	129	32.9	128	30.6
First Time Transfer	36	6.8	42	9.5	40	9.7	37	9.4	23	5.7	36	9.6
Continuing	773	227.4	856	277.6	841	274.5	809	256.1	810	250.1	756	234.7
Returning	47	10.0	43	9.5	30	7.8	23	5.6	36	8.8	20	5.6
Special Admit	5	1.1	8	1.7	22	4.9	14	3.1	11	2.3	10	2.8
Unknown	1	0.2										
Grand Total	**912**	**261.8**	**1,000**	**321.3**	**989**	**316.1**	**941**	**302.5**	**942**	**299.9**	**898**	**283.3**

2 Demographics Allan Hancock College Credit

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
Age Category	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Under 20	4,528	2,759	5,805	3,105	6,308	3,155	6,018	3,326	7,482	3,583	6,828	3,029
20-24	6,054	3,341	5,700	3,398	5,460	3,190	5,057	3,070	4,867	2,853	4,251	2,441
25-29	2,555	1,118	2,440	1,255	2,395	1,212	2,071	1,101	2,060	1,089	1,831	986
30-34	1,533	528	1,379	578	1,327	556	1,173	560	1,130	507	1,109	550
35-39	969	292	924	357	891	328	758	319	844	342	706	296
40-49	1,262	356	1,042	379	1,040	384	801	328	874	324	732	306
50+	966	248	789	227	676	210	608	189	583	185	447	151

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
ETHNICITY	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Asian	582	275	512	264	469	214	386	186	378	187	280	140
Black	673	359	583	326	555	278	459	259	491	278	437	232
Filipino	473	292	483	309	462	269	450	305	488	259	405	234
Hispanic	8,196	4,670	8,206	4,873	7,475	4,482	6,604	4,071	7,536	4,047	6,704	3,456
NativeAm	263	133	307	144	348	167	358	198	360	190	325	164
Other	2	0	4	1	5	2	2	1	2	1	2	1
PacIsl	97	50	119	62	141	62	131	74	167	81	128	62
White	6,728	2,862	7,016	3,146	7,819	3,541	7,236	3,751	7,129	3,648	6,533	3,319

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Female	8,360	4,479	8,768	4,922	8,937	4,913	8,454	4,877	8,777	4,837	8,274	4,467
Male	8,643	4,159	8,340	4,181	8,126	4,049	7,027	3,916	7,521	3,767	6,316	3,053
Unknown	3	2	109	23	181	51	121	52	228	88	209	88

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
First Time	2,920	1,185	2,777	1,194	2,562	1,089	2,666	1,240	2,620	1,189	2,263	995
First Time Transfer	2,634	616	2,111	541	2,352	656	1,766	564	1,540	447	1,312	380
Continuing	10,178	5,991	10,502	6,487	9,986	6,305	9,576	6,120	9,325	5,977	8,237	5,234
Returning	3,196	675	2,277	551	2,382	539	1,964	496	2,231	504	1,926	495
Special Admit	935	173	2,260	353	2,578	424	2,281	425	3,521	574	3,288	505
Unknown	6	2	4	0	1	0	1	0	2	0		
Grand Total	**17,004**	**8,641**	**17,217**	**9,126**	**17,235**	**9,014**	**15,597**	**8,845**	**16,523**	**8,691**	**14,794**	**7,608**

3 Program Equity Outcomes CHEM

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Under 20	387	452	0	117	81.2%	-0.6%	3	64.2%	-4.5%	21
20-24	358	412	1	114	82.7%	1.3%		64.5%	0.3%	
25-29	83	95	1	26	75.5%	-4.1%	4	64.9%	3.3%	
30-34	55	58	1	16	78.9%	-2.2%	2	71.9%	6.2%	
35-39	24	25	1	7	91.7%	5.5%		83.3%	14.5%	
40-49	13	16	1	4	93.3%	6.9%		73.3%	2.6%	
50+	3	4	0	1	100.0%			75.0%		
Grand Total	**906**	**1,062**	**5**	**286**	**81.6%**			**65.4%**		

3 Program Equity Outcomes CHEM

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Asian	17	18	0	5	77.8%	-2.7%	1	72.2%	9.3%	
Black	21	26	0	7	84.6%	2.6%		65.4%	0.9%	
Filipino	35	45	0	13	84.4%	0.7%		66.7%	0.9%	
Hispanic	422	491	1	132	79.8%	-3.6%	18	61.8%	-6.2%	31
Native Am	15	17	0	5	82.4%	0.7%		64.7%	-4.8%	1
Pac Isl	6	8	0	2	62.5%			62.5%		
White	382	446	4	120	83.9%	4.2%		69.5%	6.8%	
Unknown	8	11	0	3	72.7%			45.5%		
Grand Total	**906**	**1,062**	**5**	**286**	**81.6%**			**65.4%**		

3 Program Equity Outcomes CHEM

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Female	545	641	3	171	82.1%	1.5%		64.4%	-2.6%	17
Male	345	402	2	110	80.8%	-1.7%	7	66.8%	2.5%	
Unknown	16	19	0	5	84.2%	3.1%		68.4%	0.9%	
Grand Total	**906**	**1,062**	**5**	**286**	**81.6%**			**65.4%**		

3 Program Equity Outcomes CHEM

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
First Time	130	130	0	31	81.5%	0.5%		58.5%	-10.0%	13
First Time Tran..	37	37	0	10	83.8%	1.4%		67.6%	4.4%	
Continuing	762	865	5	237	81.3%	-2.7%	24	65.8%	3.7%	
Returning	20	20	0	6	85.0%	2.0%		70.0%	3.5%	
Special Admit	10	10	0	3	100.0%	17.6%		100.0%	13.3%	
Grand Total	**906**	**1,062**	**5**	**286**	**81.6%**			**65.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Age

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Under 20	6,318	21,130	40	2,684	89.4%	1.3%	
20-24	3,806	14,590	42	2,106	87.5%	-1.7%	242
25-29	1,639	5,059	13	842	87.6%	-0.8%	41
30-34	1,009	3,021	15	472	88.6%	0.3%	
35-39	642	1,812	15	258	90.5%	1.4%	
40-49	660	1,821	7	266	89.0%	0.2%	
50+	407	1,058	13	134	91.0%	1.9%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Under 20	6,318	21,130	40	2,684	71.0%	-3.9%	831
20-24	3,806	14,590	42	2,106	73.1%	-0.6%	89
25-29	1,639	5,059	13	842	75.4%	2.2%	
30-34	1,009	3,021	15	472	77.6%	4.6%	
35-39	642	1,812	15	258	80.9%	6.7%	
40-49	660	1,821	7	266	79.9%	5.7%	
50+	407	1,058	13	134	81.1%	6.5%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Ethnicity

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Asian	242	833	0	120	90.3%	1.7%	
Black	398	1,352	7	202	88.1%	-1.1%	15
Filipino	378	1,445	2	207	90.6%	1.8%	
Hispanic	6,317	21,790	55	3,035	87.9%	-1.6%	349
Native Am	308	1,013	8	145	85.9%	-2.7%	28
Other	2	6	0	1	83.3%		
Pac Isl	125	418	0	56	87.1%	-1.6%	7
White	5,871	20,576	72	2,859	89.4%	1.7%	
Unknown	363	1,058	1	137	88.7%	0.0%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Asian	242	833	0	120	77.4%	4.8%	
Black	398	1,352	7	202	69.3%	-5.8%	78
Filipino	378	1,445	2	207	78.9%	5.3%	
Hispanic	6,317	21,790	55	3,035	70.9%	-4.6%	1,010
Native Am	308	1,013	8	145	67.7%	-5.9%	60
Other	2	6	0	1	83.3%		
Pac Isl	125	418	0	56	68.9%	-3.7%	15
White	5,871	20,576	72	2,859	76.2%	5.0%	
Unknown	363	1,058	1	137	73.1%	-0.6%	6
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Female	7,724	27,366	75	3,881	88.9%	0.6%	
Male	5,985	20,284	69	2,770	88.3%	-0.5%	99
Unknown	283	841	1	111	87.0%	-1.8%	15
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Female	7,724	27,366	75	3,881	74.4%	2.3%	
Male	5,985	20,284	69	2,770	72.4%	-1.8%	361
Unknown	283	841	1	111	66.1%	-8.0%	68
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

Academic Year
- ○ 2015-16
- ○ 2016-17
- ○ 2017-18
- ○ 2018-19
- ○ 2019-20
- ◉ 2020-21

DemoChoice
Gender

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Student Type

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
First Time	2,157	7,000	27	898	86.4%	-2.2%	157
First Time Tran..	978	2,011	4	302	89.6%	1.8%	
Continuing	8,004	31,977	98	4,704	87.9%	-2.5%	798
Returning	1,544	2,932	11	385	87.8%	-0.3%	10
Special Admit	3,298	4,570	5	472	97.7%	9.7%	
Unknown	1	1	0	0	100.0%		
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
First Time	2,157	7,000	27	898	60.4%	-13.5%	945
First Time Tran..	978	2,011	4	302	78.4%	5.8%	
Continuing	8,004	31,977	98	4,704	74.0%	0.6%	
Returning	1,544	2,932	11	385	73.1%	0.8%	
Special Admit	3,298	4,570	5	472	87.3%	14.6%	
Unknown	1	1	0	0	100.0%		
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

4 Online / Onsite course comparison CHEM

All online courses and matching onsite courses

			Academic Year																	
			2015-16				2016-17				2017-18				2019-20				2020-21			
subject	course	Course Type	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES
CHEM	CHEM110	Online	79	83	3	10.75	65	68	3	8.81	27	27	1	3.50	30	31	2	4.02	58	59	3	7.64

4 Online / Onsite Retention & Success course comparison CHEM
All online courses and matching onsite courses

Academic Year

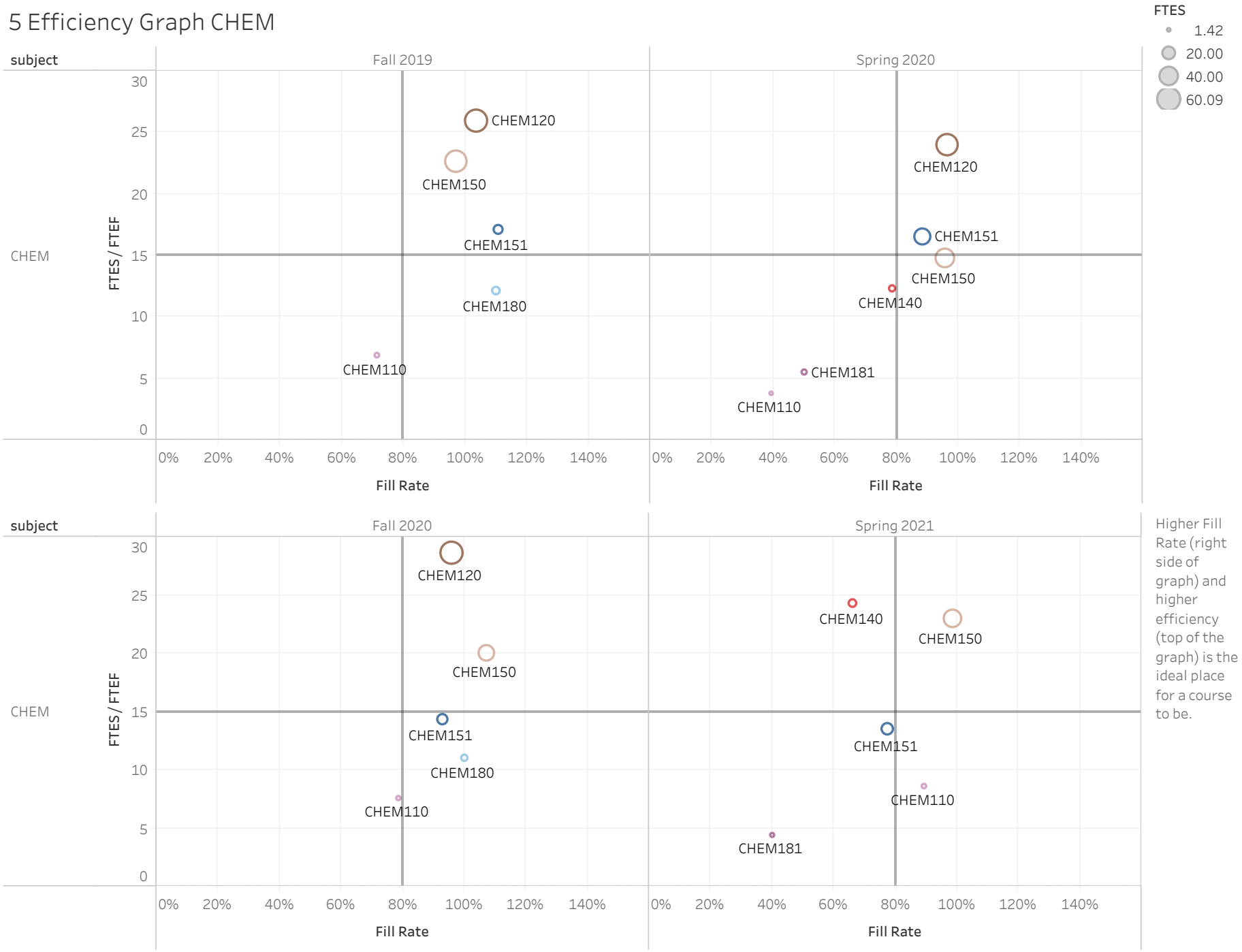
subject_	course	Course..	2015-16	2016-17	2017-18	2019-20	2020-21
CHEM	CHEM1..	Online	71% 88%	63% 84%	48% 81%	45% 71%	58% 75%

Measure Names
- Retention %
- Success %

4 Online / Onsite credit course comparison Allan Hancock College

		Academic Year					
Course Type		2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Online	Headcount	7,580	7,006	7,152	6,744	7,040	7,440
	Enrollment	15,710	15,695	15,548	15,081	15,957	18,025
	Sections	509	517	501	457	487	586
	Retention %	83%	83%	84%	85%	87%	87%
	Success %	64%	66%	67%	68%	73%	71%
	FTES	1,496	1,524	1,523	1,490	1,569	1,790
Onsite	Headcount	13,623	14,458	14,466	13,515	14,715	13,013
	Enrollment	50,973	51,353	49,698	48,165	50,024	39,626
	Sections	2,284	2,279	2,231	2,164	2,278	1,965
	Retention %	90%	90%	89%	89%	91%	90%
	Success %	75%	76%	76%	75%	80%	76%
	FTES	7,145	7,775	7,511	7,403	7,313	5,969
Grand Total	Headcount	**17,009**	**17,251**	**17,276**	**15,700**	**17,034**	**15,177**
	Enrollment	**66,683**	**67,048**	**65,246**	**63,246**	**65,981**	**57,651**
	Sections	**2,793**	**2,796**	**2,732**	**2,621**	**2,765**	**2,551**
	Retention %	**88%**	**88%**	**88%**	**88%**	**90%**	**89%**
	Success %	**72%**	**74%**	**74%**	**73%**	**78%**	**74%**
	FTES	**8,642**	**9,298**	**9,034**	**8,893**	**8,881**	**7,759**

5 Efficiency Graph CHEM



Higher Fill Rate (right side of graph) and higher efficiency (top of the graph) is the ideal place for a course to be.

5 Efficiency Table CHEM

Academic Year	Term Code_	course_	FTES	FTEF+	FTES / FTEF	Enrollment	Maximum Enrollment	MaxEnroll..	Fill Rate
2019-20	Sum 2019	CHEM120	25	2.156	11.8	126	140	28	90%
		CHEM140	3	0.386	6.6	13	28	28	46%
		Total	**28**	**2.542**	**11.0**	**139**	**168**	**28**	**83%**
	Fall 2019	CHEM110	3	0.376	6.9	20	28	28	71%
		CHEM120	60	2.316	25.9	261	252	28	104%
		CHEM150	56	2.475	22.7	163	168	28	97%
		CHEM151	10	0.575	17.1	31	28	28	111%
		CHEM180	7	0.575	12.1	22	20	20	110%
		Total	**136**	**6.317**	**21.5**	**497**	**496**	**28**	**100%**
	Spring 2020	CHEM110	1	0.376	3.8	11	28	28	39%
		CHEM120	56	2.316	24.0	243	252	28	96%
		CHEM140	5	0.376	12.3	22	28	28	79%
		CHEM150	43	2.875	14.8	134	140	28	96%
		CHEM151	31	1.900	16.5	99	112	28	88%
		CHEM181	3	0.575	5.5	10	20	20	50%
		Total	**139**	**8.418**	**16.5**	**519**	**580**	**28**	**89%**
	Total		**302**	**17.277**	**17.5**	**1,155**	**1,244**	**28**	**93%**
2020-21	Sum 2020	CHEM110	2	0.782	2.0	12	28	28	43%
		CHEM120	29	1.176	24.3	119	140	28	85%
		Total	**30**	**1.958**	**15.4**	**131**	**168**	**28**	**78%**
	Fall 2020	CHEM110	3	0.376	7.6	22	28	28	79%
		CHEM120	77	2.704	28.6	322	336	28	96%
		CHEM150	38	1.900	20.0	120	112	28	107%
		CHEM151	17	1.150	14.3	52	56	28	93%
		CHEM180	6	0.575	11.0	20	20	20	100%
		Total	**141**	**6.705**	**21.1**	**536**	**552**	**28**	**97%**
	Spring 2021	CHEM110	3	0.376	8.6	25	28	28	89%
		CHEM120	61	1.928	31.6	253	252	28	100%
		CHEM140	9	0.376	24.3	37	56	28	66%
		CHEM150	48	2.100	23.0	138	140	28	99%
		CHEM151	21	1.525	13.5	65	84	28	77%

5 Efficiency Table CHEM

Academic Year	Term Code_	course_	FTES	FTEF+	FTES / FTEF	Enrollment	Maximum Enrollment	MaxEnroll..	Fill Rate
2020-21	Spring 2021	CHEM181	3	0.575	4.4	8	20	20	40%
		Total	145	6.880	21.0	526	580	28	91%
	Total		316	15.543	20.3	1,193	1,300	28	92%
Grand Total			618	32.820	18.8	2,348	2,544	28	92%

6 Degree/Certificate Chemistry

					Academic Year Graduation Desc					
	Program Desc	Degree	Degree Major	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Unduplicated	Chemistry	AA	Chemistry	Associate in Arts	10	9	10	14	8	10
		AS-T	Chemistry for Transf..	Associate in Science-Transfer			1	3	1	
			Chemistry for Transf..	Associate in Science-Transfer						2
Duplicated	Chemistry	AA	Chemistry	Associate in Arts	10	9	10	14	8	10
		AS-T	Chemistry for Transf..	Associate in Science-Transfer			1	3	1	
			Chemistry for Transf..	Associate in Science-Transfer						2
Unduplicated	Total				10	9	10	16	8	12
Duplicated	Total				10	9	11	17	9	12

6 Majors Chemistry - Headcount

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Chemistry	120	151	140	125	113	79
Chemistry for Transfer CSU			15	35	47	35
Chemistry for Transfer UC					11	23
Grand Total	120	151	154	158	163	134

6 Chemistry Award|Major Match

--If a student has the same program of study and major as the award earned they will be a 'Major Match'. If not they will be a 'Major Split'.

--Headcount & Percentages are the students who are a major match/split for a specific award.

--Data is sorted by program/major of the earned award.

					Academic Year Graduation Desc											
					2015-2016		2016-2017		2017-2018		2018-2019		2019-2020		2020-2021	
Program..	Degree	Degree Major	Degree Desc (group)	Major ..	HC	%	HC	%	HC	%	HC	%	HC	%	HC	%
Chemistry	AA	Chemistry	Associate in Arts	Match	1	10%	2	22%	1	10%	1	7%			1	10%
				Split	9	90%	7	78%	9	90%	13	93%	8	100%	9	90%
	AS-T	Chemistry for Transfer CSU	Associate in Science-Transfer	Match							2	67%	1	100%		
				Split					1	100%	1	33%				
		Chemistry for Transfe..	Associate in Science-Transfer	Split											2	100%
	Total				10	100%	9	100%	10		16		8		12	

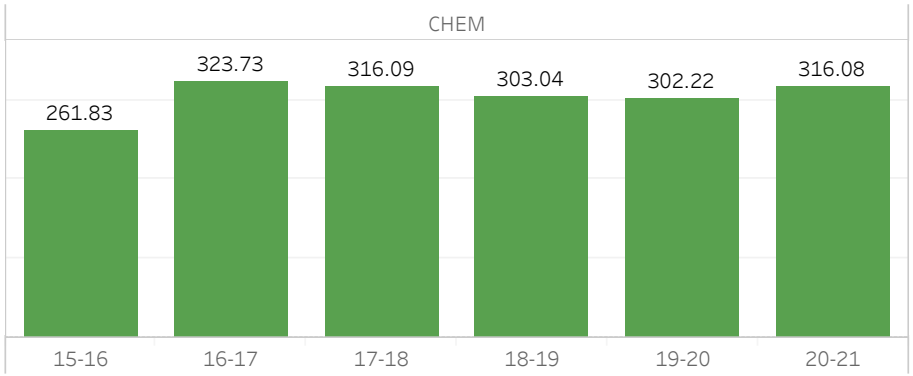
6 Degree/Certificate Allan Hancock College

		Academic Year Graduation Desc					
	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Unduplicated	Associate in Arts	494	523	493	589	882	885
	Associate in Arts - Transfer	92	126	159	164	218	262
	Associate in Science	277	319	313	321	304	310
	Associate in Science-Transfer	95	128	126	191	228	249
	Certificate of Accomplishment	381	419	416	372	423	328
	Certificate of Achievement	681	795	791	876	810	1,156
	NC Cert 48 to <96 hrs	3	10	22	21	22	5
	NC Cert 144 to <192 hrs						6
	NC Cert 192 to <288 hrs	7	5	1	6	13	
	NC Cert 288 to <480 hrs	2	27	46	38	32	3
	NC Cert 480 to <960 hrs			2	9	32	
Duplicated	Associate in Arts	709	726	737	814	1,437	1,616
	Associate in Arts - Transfer	95	130	163	165	229	341
	Associate in Science	307	347	345	350	335	332
	Associate in Science-Transfer	99	133	138	207	237	323
	Certificate of Accomplishment	404	501	491	417	478	373
	Certificate of Achievement	722	846	870	958	865	1,636
	NC Cert 48 to <96 hrs	3	10	23	21	22	5
	NC Cert 144 to <192 hrs						6
	NC Cert 192 to <288 hrs	7	5	1	6	13	
	NC Cert 288 to <480 hrs	2	34	46	39	33	3
	NC Cert 480 to <960 hrs			2	9	32	
Unduplicated	Total	**1,491**	**1,703**	**1,673**	**1,804**	**1,972**	**1,983**
Duplicated	Total	**2,348**	**2,732**	**2,816**	**2,986**	**3,681**	**4,635**

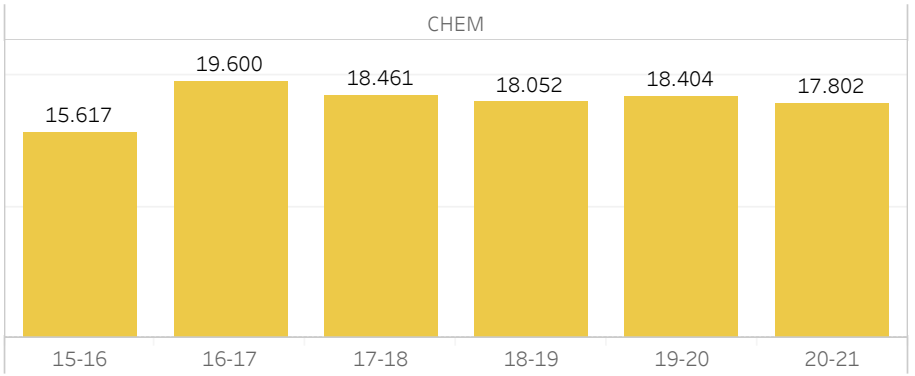
7 FTEF+Overload, FTES & Efficiency - CHEM

Academic Year																	
2015-2016			2016-2017			2017-2018			2018-2019			2019-2020			2020-2021		
FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF
15.617	261.83	16.8	19.600	323.73	16.5	18.461	316.09	17.1	18.052	303.04	16.8	18.404	302.22	16.4	17.802	316.08	17.8

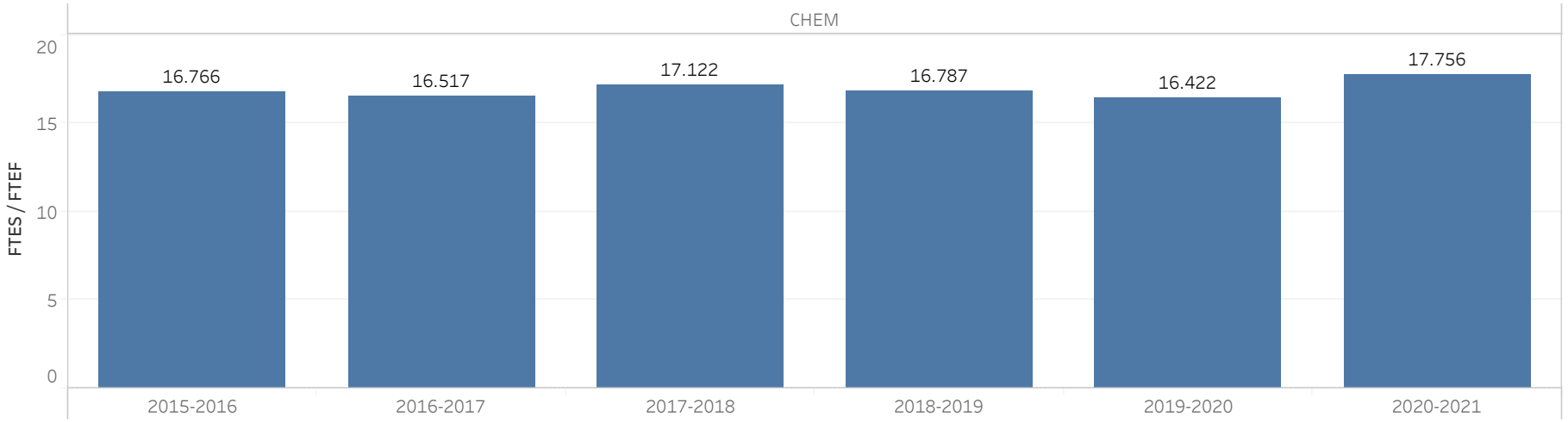
FTES



FTEF



FTEF/ FTES

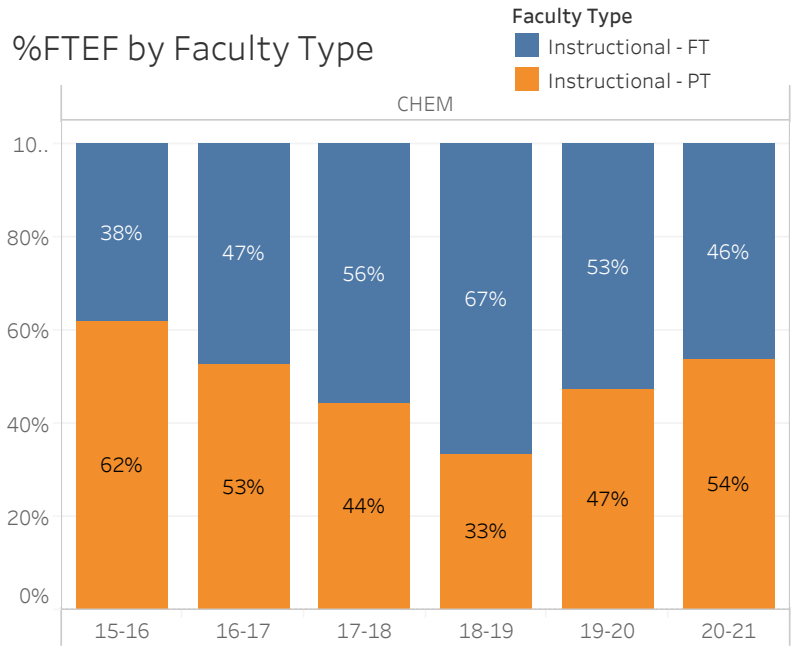


Faculty Type

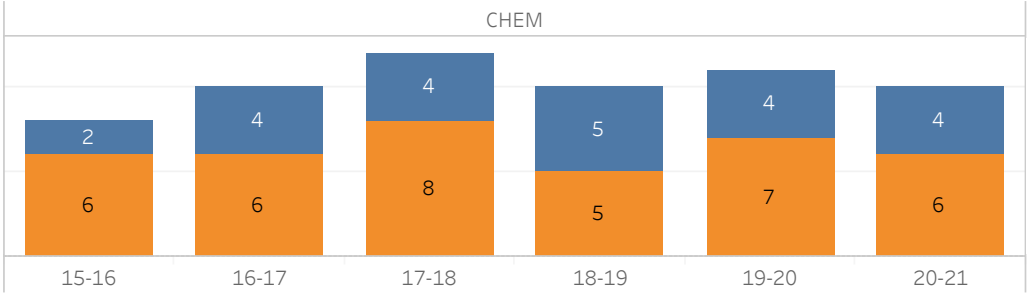
subject_	Faculty Type	2015-2016 FTEF	2015-2016 Overload_	2015-2016 Faculty	2015-2016 Sections	2016-2017 FTEF	2016-2017 Overload_	2016-2017 Faculty	2016-2017 Sections	2017-2018 FTEF	2017-2018 Overload_	2017-2018 Faculty	2017-2018 Sections
CHEM	Instructional - FT	5.004	2.530	2	17	7.955	2.795	4	26	8.771	2.757	4	25
	Instructional - PT	8.083	0.000	6	22	8.850	0.000	6	25	6.933	0.000	8	20
Grand Total		**13.087**	**2.530**	**8**	**38**	**16.805**	**2.795**	**10**	**48**	**15.704**	**2.757**	**12**	**43**

subject_	Faculty Type	2018-2019 FTEF	2018-2019 Overload_	2018-2019 Faculty	2018-2019 Sections	2019-2020 FTEF	2019-2020 Overload_	2019-2020 Faculty	2019-2020 Sections	2020-2021 FTEF	2020-2021 Overload_	2020-2021 Faculty	2020-2021 Sections
CHEM	Instructional - FT	9.98	3.06	5	28	8.39	2.50	4	25	6.94	2.80	4	22
	Instructional - PT	5.02	0.00	5	14	7.52	0.00	7	21	8.07	0.00	6	25
Grand Total		**14.99**	**3.06**	**9**	**42**	**15.91**	**2.50**	**11**	**46**	**15.01**	**2.80**	**10**	**47**

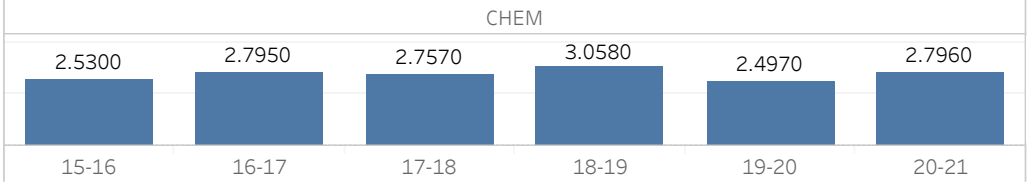
%FTEF by Faculty Type



Faculty count by type



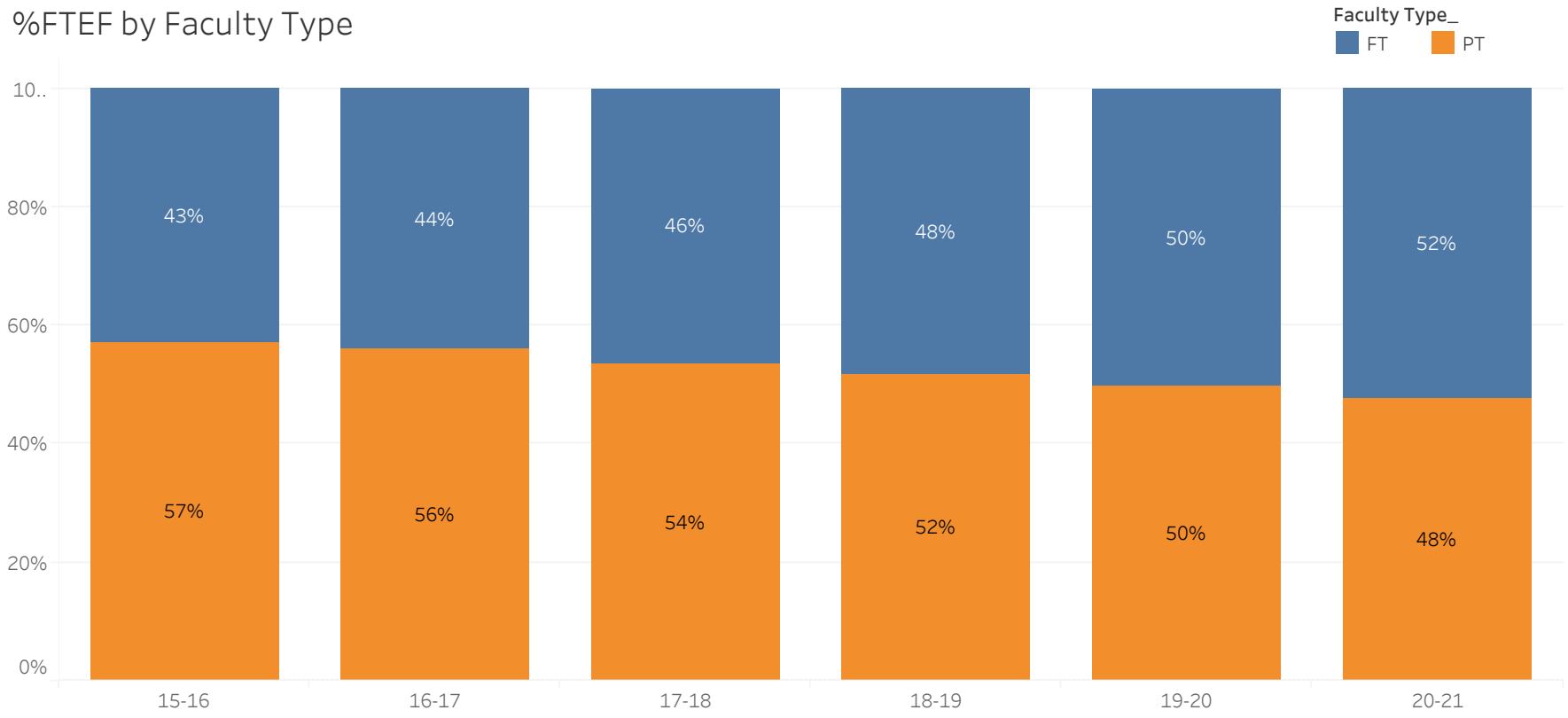
Overload



7 FTEF+Overload by Faculty Type Allan Hancock College

		Academic Year					
Instruction ..	Faculty Type	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Instructional	Instructional - FT	310.594	331.703	344.107	343.923	340.591	328.688
	Instructional - PT	359.820	355.797	331.111	315.432	300.351	263.265
	Total	**670.414**	**687.500**	**675.218**	**659.355**	**640.942**	**591.953**
Grand Total		**670.414**	**687.500**	**675.218**	**659.355**	**640.942**	**591.953**

%FTEF by Faculty Type



Appendix A: Program/Course Demographics by Outcome CHEM

		Academic Year											
		2018-19				2019-20				2020-21			
		Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %
CHEM110	Under 20					7	0.9	71%	57%	17	2.2	76%	53%
	20-24					8	1.0	50%	38%	18	2.3	72%	56%
	25-29					4	0.6	100%	20%	6	0.8	67%	67%
	30-34					6	0.8	100%	83%	2	0.3	100%	50%
	35-39					2	0.3	0%	0%	2	0.3	100%	100%
	40-49					2	0.3	50%	50%	1	0.3	50%	50%
	50+					1	0.1	100%	0%				
CHEM120	Under 20	320	73.0	88%	69%	297	68.5	90%	76%	284	68.4	83%	65%
	20-24	209	48.0	84%	65%	205	47.4	86%	77%	171	42.8	86%	68%
	25-29	68	15.4	83%	71%	59	13.2	82%	75%	52	13.6	81%	72%
	30-34	18	4.5	79%	63%	28	6.6	96%	93%	29	7.1	89%	86%
	35-39	11	2.6	91%	82%	9	1.9	100%	100%	15	4.0	93%	80%
	40-49	7	1.6	100%	100%	12	2.6	92%	92%	8	1.9	100%	100%
	50+	3	0.6	67%	33%	4	0.9	100%	100%	2	0.5	100%	50%
CHEM140	Under 20	2	0.4	50%	50%	11	2.2	100%	100%	5	1.2	100%	100%
	20-24	18	3.8	78%	78%	12	2.4	100%	100%	21	5.1	95%	86%
	25-29	4	0.9	75%	75%	4	0.8	100%	100%	3	0.7	33%	33%
	30-34	1	0.2	0%	0%	4	0.8	100%	100%	6	1.6	83%	67%
	35-39					2	0.4	100%	100%	2	0.5	50%	50%
	40-49					1	0.2	100%	100%				
	50+					1	0.2	100%	100%				
CHEM150	Under 20	130	41.3	92%	78%	134	46.8	84%	71%	94	33.2	76%	62%
	20-24	128	42.2	85%	71%	110	36.6	84%	77%	104	35.8	85%	69%
	25-29	35	12.1	79%	74%	22	7.3	75%	70%	20	7.3	71%	52%
	30-34	14	4.4	86%	79%	12	4.0	91%	82%	13	5.0	57%	57%
	35-39	2	0.6	100%	100%	8	2.5	88%	88%	6	2.3	100%	100%
	40-49					4	1.3	33%	0%	5	1.9	100%	50%
	50+									2	0.8	100%	100%
CHEM151	Under 20	32	10.2	91%	84%	35	11.7	91%	88%	36	11.4	78%	61%
	20-24	75	25.7	86%	75%	63	20.6	91%	88%	58	20.9	73%	47%

Appendix A: Program/Course Demographics by Outcome CHEM

		Academic Year											
		2018-19				2019-20				2020-21			
		Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %
CHEM151	25-29	13	4.4	64%	64%	16	5.1	94%	88%	7	2.5	75%	63%
	30-34	7	2.2	86%	86%	7	2.5	88%	75%	6	1.9	67%	67%
	35-39	1	0.3	100%	100%	3	1.0	100%	100%				
	40-49	1	0.3	100%	100%	1	0.3	100%	100%	1	0.3	100%	0%
CHEM180	Under 20	3	1.0	67%	33%	6	1.9	100%	100%	1	0.3	100%	100%
	20-24	14	4.4	64%	57%	13	4.1	62%	54%	16	5.1	53%	33%
	25-29	2	0.6	0%	0%	1	0.3	0%	0%	2	0.6	50%	50%
	30-34									1	0.3	100%	0%
	40-49					1	0.3	100%	100%				
	50+					1	0.3	0%	0%				
CHEM181	Under 20	1	0.3	100%	100%	2	0.6	100%	100%				
	20-24	6	1.9	83%	83%	7	2.2	100%	100%	7	2.2	100%	100%
	25-29					1	0.3	100%	100%	1	0.3	100%	100%

Appendix B: Major match detail

--If a student has the same program of study and major as the award earned they will be a 'Major Match'. If not they will be a 'Major Split'.
--Headcount & Percentages are the students who are a major match/split for a specific award.
--Data is sorted by program/major of the earned award.

						Academic Year Graduation Desc					
Major Match	Program Desc	Degree	Degree Major	Student Major	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Match	Chemist..	AA	Chemistry	Chemistry	Associate in Arts	1	2	1	1		1
		AS-T	Chemistry for Transfer CSU	Chemistry for Transfer CSU	Associate in Science-Tra..				2	1	
		Total				**1**	**2**	**1**	**3**	**1**	**1**
	Total					**1**	**2**	**1**	**3**	**1**	**1**
Split	Chemist..	AA	Chemistry	Biology	Associate in Arts			1			
				Chemistry for Transfer CSU	Associate in Arts					1	
				Civil Engineering	Associate in Arts	1	1	2			
				Computer Science	Associate in Arts				2		
				Electronic Engineering Tech	Associate in Arts				2		
				Electronic Technology	Associate in Arts					1	
				Engineering	Associate in Arts	6	4	4	9	4	8
				Engineering Technology	Associate in Arts		1				
				Engr Tech: Mechatronics	Associate in Arts			1			
				Math: Physics Emphasis	Associate in Arts						1
				Mathematics and Science CSU	Associate in Arts	1	1				
				Mathematics: Comp Sci Emph..	Associate in Arts					1	
				Spanish for Transfer CSU	Associate in Arts					1	
				Undeclared	Associate in Arts	1					
				Viticulture	Associate in Arts			1			
		AS-T	Chemistry for Transfer CSU	Chemistry	Associate in Science-Tra..				1		
				Engineering	Associate in Science-Tra..			1			
			Chemistry for Transfer UC	Biology for Transfer UC	Associate in Science-Tra..						1
				Chemistry for Transfer CSU	Associate in Science-Tra..						1
		Total				**9**	**7**	**9**	**14**	**8**	**11**
	Total					**9**	**7**	**9**	**14**	**8**	**11**
Grand Total						**10**	**9**	**10**	**16**	**8**	**12**

COURSE REVIEW VERIFICATION

Discipline: Chemistry Year: 2021-2022

As part of the program evaluation process, the self-study team has reviewed the course outlines supporting the discipline/program curriculum. The review process has resulted in the following recommendations:

1. The following course outlines are satisfactory as written and do not require modification (list all such courses):

CHEM 120, 140, 150, 151, 180, and 181.

2. The following courses require minor modification to ensure currency. The self study team anticipates submitting such modifications to the AP&P, FALL 20____ SPRING 20____:

3. The following courses require major modification. The self study team anticipates submitting such modifications to the AP&P committee, FALL 20____ SPRING 20____:

GRADUATION REQUIREMENTS: General Education (GE), Multicultural/Gender Studies (MCGS) and Health & Safety (H&W) Courses.

The following courses were reviewed as meeting an **AHC GE** requirement. The AP&P GE Criteria and Category Definitions (GE Learning Outcomes) forms were submitted to the AP&P for review on: _____

The following courses were reviewed as meeting the **MCGS** requirement. The AP&P MCGS Criteria and Category Definitions (MCGS Learning Outcomes – To Be Developed) forms were submitted to the AP&P for review on: _____

The following courses were reviewed as meeting the **H&W** requirement. The AP&P H&W Studies Criteria (To Be Developed) and Category Definitions (H&W Learning Outcomes – To Be Developed) forms were submitted to the AP&P chair for review on: _____

Course Review Team Members:

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature AP&P Chair	Date
Name	Signature Academic Dean	Date

APPENDICES
Approved Course Outlines
Advisory Committee

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 120**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
3. EVA report from Computer Services reflecting student success based on completion and noncompletion of prerequisite course.

Process:

1. Examine objectives of course being reviewed.
   Are objectives current? YES
   Will student successfully completing this course have a reasonable chance of success in subsequent course? YES
2. Examine objectives of preceding course.
   Are the objectives equivalent of the entrance skills necessary to succeed in the course being reviewed? YES
3. Examine the evaluation tools used within the course.
   Do the tests, quizzes, projects, assignments reflect skills which the student would have acquired in the preceding course? YES
4. Examine the text used for the course
   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

Based on the attached documentation, it is the recommendation of the faculty that:

X The prerequisite/corequisite/advisory is appropriate.
(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 2021 9/22/22
Initiator Date

Ashley Wise 2021 9/21/2022
Department Chair Date

Approved: _____, Academic Dean -- Date 9/21/2022

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 140**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
3. EVA report from Computer Services reflecting student success based on completion and noncompletion of prerequisite course.

Process:

1. Examine objectives of course being reviewed.
   Are objectives current? YES
   Will student successfully completing this course have a reasonable chance of success in subsequent course? YES
2. Examine objectives of preceding course.
   Are the objectives equivalent of the entrance skills necessary to succeed in the course being reviewed? YES
3. Examine the evaluation tools used within the course.
   Do the tests, quizzes, projects, assignments reflect skills which the student would have acquired in the preceding course? YES
4. Examine the text used for the course
   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

Based on the attached documentation, it is the recommendation of the faculty that:

X The prerequisite/corequisite/advisory is appropriate.
(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 9/22/22 **2021** **Ashley Wise** 9/21/2022 **2021**

Initiator Date Department Chair Date

Approved: _____, Academic Dean -- Date 9/20/2022

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 150**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
3. EVA report from Computer Services reflecting student success based on completion and noncompletion of prerequisite course.

Process:

1. Examine objectives of course being reviewed.
   Are objectives current? YES
   Will student successfully completing this course have a reasonable chance of success in subsequent course? YES
2. Examine objectives of preceding course.
   Are the objectives equivalent of the entrance skills necessary to succeed in the course being reviewed? YES
3. Examine the evaluation tools used within the course.
   Do the tests, quizzes, projects, assignments reflect skills which the student would have acquired in the preceding course? YES
4. Examine the text used for the course
   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

Based on the attached documentation, it is the recommendation of the faculty that:

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(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 9/22/22 **Ashley Wise** 9/21/2022

Initiator Date Department Chair Date

Approved: _____, Academic Dean -- Date 9/20/2022

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 151**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
3. EVA report from Computer Services reflecting student success based on completion and noncompletion of prerequisite course.

Process:

1. Examine objectives of course being reviewed.
   Are objectives current? YES
   Will student successfully completing this course have a reasonable chance of success in subsequent course? YES
2. Examine objectives of preceding course.
   Are the objectives equivalent of the entrance skills necessary to succeed in the course being reviewed? YES
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   Do the tests, quizzes, projects, assignments reflect skills which the student would have acquired in the preceding course? YES
4. Examine the text used for the course
   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

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X The prerequisite/corequisite/advisory is appropriate.
(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 9/22 **2021**
Initiator Date

Ashley Wise 9/21/2022
Department Chair Date

Approved: _____, Academic Dean -- Date 9/20/2022

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 180**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
3. EVA report from Computer Services reflecting student success based on completion and noncompletion of prerequisite course.

Process:

1. Examine objectives of course being reviewed.
   Are objectives current? YES
   Will student successfully completing this course have a reasonable chance of success in subsequent course? YES
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   Are the objectives equivalent of the entrance skills necessary to succeed in the course being reviewed? YES
3. Examine the evaluation tools used within the course.
   Do the tests, quizzes, projects, assignments reflect skills which the student would have acquired in the preceding course? YES
4. Examine the text used for the course
   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

Based on the attached documentation, it is the recommendation of the faculty that:

X The prerequisite/corequisite/advisory is appropriate.
(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 9/22/2021
Initiator Date

Ashley Wise 9/21/2022
Department Chair Date

Approved: _____, Academic Dean -- Date 9/30/2022

CONTENT REVIEW

WITHIN THE SAME DISCIPLINE OR ACROSS DISCIPLINES

Course Prefix and Number **CHEM 181**

Department Life and Physical Sciences Responsible Instructor Dustin Nouri

PCA being reviewed: UC/CSU Comparison Sheets Type: Prerequisite

Use one form for each prerequisite/corequisite/advisory if the course has more than one

Review Team (Recommended: four instructors; preferably two of whom teach the course being reviewed; one who teaches the preceding course, and one who teaches the subsequent course, as appropriate)

Sean Gottlieb Danae Madrid

Dustin Nouri

Recommended Materials:

1. Course outline for course being reviewed preceding course and subsequent course
2. For each course, current text, typical tests, sample projects, quizzes, and any other relevant evaluation tools as used within the courses and evidenced by the course outline, written grading standards (possibly from syllabus).
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   Does the textbook require a base of knowledge the student would have obtained in the preceding course? YES

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(circle one)

___ The prerequisite/corequisite/advisory should be deleted.
(circle one)

___ The prerequisite/corequisite/advisory should be modified.
(circle one)

___ The course outline should be modified to reflect outcomes of content review, and to include entrance/exit skills.

Dustin Nouri 9/22/2021
Initiator Date

Ashley Wise 9/21/2022
Department Chair Date

Approved: _____, Academic Dean -- Date 9/20/2022

PROGRAM REVIEW -- VALIDATION TEAM MEMBERS

TO: Academic Dean Date: 1/26/2022

From: Dustin Nouri

We recommend the following persons for consideration for the validation team:

DEPARTMENT CHEMISTRY

Board Policy requires that the validation team be comprised of the dean of the area, one faculty member from a related discipline/program, and two faculty members from unrelated disciplines.

Sean Gottlieb and Danae Madrid	Chemistry
(Name)	(Related Discipline/Program)
Patrick McGuire	Automotive
(Name)	(Unrelated Discipline/Program)
Michael Wagner	Computer Science/Mathematics
(Name)	(Unrelated Discipline/Program)

At the option of the self-study team, the validation team !illl)'. also include one or more of the following: a. someone from a four-year institution in the same discipline; someone from another community college in the same discipline; a high school instructor in the same discipline; a member of an adviso committee for the ro am. Please com lete the followin as relevant to our ro am review.

(Name) (Title)

Affiliation: Telephone Contact Number:

Address

Mailin City/State/Zip email address

(Name) (Title)

Affiliation: Telephone Contact Number:

Address

(Mailing) City/State/Zip email address

(Name) (Title)

Affiliation: Telephone Contact Number:

Address

(Mailing) City/State/Zip email address

APPROVED: 1/26/2022

Academic Dean Date

VALIDATION
Executive Summary
Plan of Action - Post Validation

EXECUTIVE SUMMARY (Validation Team Report)

The Validation Team for the 2022 Chemistry six-year program review—consisting of Computer Science faculty member Michael Wagner, Automotive faculty member Patrick McGuire, authors of the Program Review and Chemistry faculty members Dustin Nouri and Sean Gottlieb, and Dean Sean J. Abel—met to review and discuss the comprehensive program review for approximately 75 minutes on Friday September 2, 2022. It was clear that each member of the team had reviewed the document with care and came prepared to provide feedback and suggestions to the document's authors.

1. MAJOR FINDINGS

Strengths of the program/discipline:

The team members noted the attention to detail, consideration, and thought that was evident throughout the document. The team was able to discuss the content of the document and work with the author to clarify the impact of the document to the program.

As the team reviewed and reflected upon the document together, they commented on the positive way that the program meets the needs of all students through courses focused on transfer and meeting the C-ID and Associate of Science in Chemistry for Transfer, general education, and prerequisites for degrees and certificates in the various Allied Health programs. Student survey data reflected satisfaction with the program and how it meets their needs and educational goals. This has resulted in program courses being well-enrolled to the point where there are consistently waitlists on a significant majority of the course sections including steady growth at the Lompoc Valley Center campus. The chemistry faculty have further helped student success and completion by ensuring thorough guided pathways mapping and implementation of that mapping by scheduling to follow those maps.

This program growth resulted in the recent addition of new full-time faculty members (one replacement and one growth). The team discussed this addition to the program's high quality, caring faculty as well as the college's support of a mid-year faculty search to replace a recent, unexpected full-time faculty member's resignation. Such broad college support indicates the institutional importance of chemistry as a discipline and the impact it has on nearly every student attending the college. By keeping maps up-to-date, chemistry participates in excellent inter-disciplinary cooperation and coordination for the benefit of our students.

Other areas of strength include chemistry facilities, particularly the laboratory classroom spaces. These spaces well support the course and program curriculum and are designed with safety in mind. The chemistry program is also typically well-funded for needed equipment and supplies, although there are always needs to be met as processes and technologies change. Our lab specialists (one in Santa Maria, one in Lompoc) keep equipment up-to-date as needed. An example of this would be the recent replacement of analytical balances, similar to other

equipment at the end of its useful life.

Concerns regarding the program/discipline:

As the team discussed the document with the authors, challenges for the program were remarked upon by all. Three highly impactful main themes were discussed—student preparation for chemistry courses, space/facilities resources, and anticipated staffing needs.

The authors pointed out a concern regarding student preparation for chemistry courses, particularly after several semesters of pandemic-related online and/or hybrid classes. This has been particularly prominent in mathematics preparation. This concern is compounded by the change in the enforcement of AB705 rules which have eliminated developmental mathematics courses. Students are frequently having to catch up in their mathematics skills while struggling with entirely different mathematics concepts in chemistry, and presumably, the other sciences.

The Chemistry (and most other science) programs are struggling with space to accommodate enrollment, resulting in frequent large waitlist which impacts the students' abilities to complete their degree programs in a timely manner. Although the spaces we have are excellent, the college lacks sufficient classrooms which can accommodate double lab lectures of nearly 60 students. As the chemistry program continues to grow, there is a need for an additional chemistry lab on the Santa Maria campus and additional shared lab space on the Lompoc Valley Center campus.

The final impactful main theme focused on staffing. Given the college's location, it can be very difficult to find highly qualified part time faculty members who are able teach at a broad spectrum of times. The expansion of full-time faculty by one or more members may help ameliorate staffing issues during the day, but that remains to be seen over time. As the program grows, another staffing concern is lab specialists/associates/assistants on both campuses. Current incumbents are managing with the existing schedule but additions may strain their capacities. Additionally, student survey reflected a need for chemistry related tutorial services. The underlying reason for this was unclear. The team discussed strategies for improving the connection between chemistry students and the STEM center for tutoring.

Lastly, the team discussed two other specific challenges. The first of these focused on the costs for science classes in general. Particularly for chemistry, some published materials are very expensive for students and this may be a barrier to completion. The second was a concern regarding disconnect between the desires of the Chancellor's office/legislature related to ADT units and the reality of course unit requirements in the C-ID descriptors. The legislation requires that Associate Degrees for Transfer be only 60 units; however, transfer institutions require specific courses in the C-ID descriptors to have more units than are noted in the ADT templates. This is a challenge that is likely beyond the scope of the program to correct, but needed to be noted.

2. RECOMMENDATIONS

Based on the discussion and program challenges, the team and authors proposed recommendations. The subject of the first recommendation was how to bridge this program review process to the process starting in the 2022-2023 academic year. One team member

indicated that they would assist the authors in formatting the action plan to appropriately match the new program review process. As we discussed the above listed concerns for the program, the team outlined various recommendations. It was recommended that faculty members in the chemistry program continue to communicate with other disciplines, especially mathematics, to benefit student success. Of particular note was the recommendation to investigate how mathematics and chemistry can collaborate to improve students' chemistry-related mathematics skills. Similar to other life and physical science program reviews, the team recommended that the program continue to advocate for additional lecture and lab space through the master planning process as well as investigate expanding online chemistry general education offerings in order to help ameliorate the impact of waitlists in the program. Because the chemistry program is continuing on a growth trajectory, the team recommends that the program continues to advocate for additional full-time faculty members and lab specialists/associates/assistants to meet the needs of increasing numbers of students. As part of equipment procurement, the team recommends that a detailed repair and replacement schedule be developed for high use items. This will assist in budgeting processes and avoid frequent and irregular large funding requests. To continue to improve student success rates, members of the team suggested that the program investigate ways to increase student connections with the STEM center and that faculty expand the use of locally created, campus published course materials to reduce cost barriers.

Summary prepared by Sean J. Abel
Dean, Academic Affairs

PLAN OF ACTION – POST-VALIDATION
(Sixth-Year Evaluation)

DEPARTMENT: Life and Physical Sciences PROGRAM: CHEMISTRY

In preparing this document, refer to the Plan of Action developed by the discipline/program during the self-study, and the recommendations of the Validation Team. Note that while the team should strongly consider the recommendations of the validation team, these are recommendations only. However, the team should provide a rationale when choosing to disregard or modify a validation team recommendation.

Identify the actions the discipline/program plans to take during the next six years. Be as specific as possible and indicate target dates. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan. (See Institutional Goals and Objectives) The completed final plan should be reviewed by the department as a whole.

RECOMMENDATIONS TO IMPROVE **STUDENT LEARNING OUTCOMES** AND ACHIEVMENT	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
1) The chemistry faculty will continue to support the MESA and STEM programs as well as the Learning Resource Center at the Santa Maria and Lompoc Valley Center campuses to help inform students of their support services. The faculty will continue to promote high academic standards and success in achieving Program Learning Outcomes so that our students may thrive once they have moved on to the next stage of their academic careers.	1) A.1/A.7/B.7/C.7.	1) ONGOING
2) The chemistry faculty will continue to remain current in the latest chemistry literature and useful technology to help convey the material at the appropriate undergraduate level.	2) B.7.	2) ONGOING
3) The full-time chemistry faculty will work with the Union and current contracts to help ensure the adjunct-faculty are properly compensated for the additional work associated with inputting Program Learning Outcome data.	3) B.7.	3) ONGOING

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Enrollment Changes The chemistry curriculum sections are growing and expanding. Additional lab space is being required at both campuses over the next program cycle. LVC has begun looking into converting LVC3-109 into a science lab. As they currently only have one functioning chemistry lab, this will help free up LVC3-102 for evening course offerings. The SM campus will likely look into M-212 since that lab has fume-hoods. Lab benches and gas lines will need to be run to make the room fully functional.	A.2/B.4/D.5	ONGOING
Demographic Changes The chemistry program will continue to consider accommodations for student whom cannot attend day time classes. We need to expand LVC offerings and evening sections. Outfitting lecture and lab rooms with Zoom equipment can help during challenging times.	A.3/D.5/D.7	ONGOING

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Curricular Changes The chemistry faculty are updating curriculum to better serve the needs of the students. Our CHEM140 course will be mapped to the C-ID CHM102 to help ease any transfer issues. Sections of this course may be expanded to the sister campus, LVC, as need grows.	B.8	ONGOING
Co-Curricular Changes A math review CANVAS course may need to be created to help our incoming students meet the Basic Math Skills they require to succeed.	B.8	ONGOING

Neighboring College and University Plans The chemistry faculty will continue to work with neighboring colleges and universities to ensure that courses articulate and topics are aligned.	C.3/C.8/D.6/E.3	ONGOING
Related Community Plans The chemistry faculty will continue to volunteer when asked as we have for science fairs, Friday Night Science, tours of our department, brining hand-on chemistry to other schools, and presenting professional development activities.	A.1/A.5/A.6/E.7/E.8	ONGOING

RECOMMENDATIONS THAT REQUIRE ADDITIONAL RESOURCES	Theme/Objective/ Strategy Number AHC from Strategic Plan	TARGET DATE
Facilities 1) Service the fume-hoods annually as Cal OSHA requires (Keenan). 2) LVC3-102, 3-114, 2-212, and 2-102 need smart podium upgrades. 3) Need new whiteboards for M205/M213 4) Need new projector screens for M205/M-213 5) LVC 3-102 requires new ballasts for lighting 6) Expansion into M212? ($235,000)	A.1/A.4/B.1/B.2/ B.3/E.1/E.2	1)ONGOING 2)FALL2023 3)FALL2025 4)SPRING2026 5) SPRING2023 6) SPRING2027
Equipment 1) SM Gloves ($10,000) LVC Gloves ($10,000) 2) SM Equipment under $500 ($4,000) + inflation ($1200) LVC Equipment under $500 ($3,000) + inflation ($1200) 3) SM Goggles ($12,000) LVC Goggles ($12,000) 4) SM Analytical Balance ($3,500) LVC 7 Analytical Balances ($48,000) 5) SM 16 Centrifuges ($38,400) 6) ChemDraw Software ($10,625) 7) SM Repairs ($500) LVC Repairs ($500) 8) LVC Water Bath ($900) 9) LVC Fume-hoods and gas lines for new chemistry lab (LVC3-109). 10) SM gas lines and lab benches/stools for new chemistry lab (M-212) 11) LVC MelTemp equipment for CHEM140 ($7200) 12) Student laptops at SM and LVC campuses need to be refreshed. 13) SM Large HotPlate ($1200)	A.1/A.4/B.1/B.2/ B.3/D.6/D.7/E.1/ E.2	1) ONGOING 2) ONGOING 3) FALL2023 4) FALL2023 5) FALL2023-SPRING2024 6) FALL2025 7) ONGOING 8) FALL2022 9)FALL2024 10)FALL2026 11)FALL2027 12) ONGOING 13) FALL2023

Staffing 1) Need full-time chemists to help fill the demand and need of the current sections offered and expanding. 2) SM Chemistry and Biology Lab Associate Position (+$55,000) 3) LVC Chemistry and Biology Lab Associate Position (+$55,000)	A.1/A.4/B.1/B.2/ B.3/E.1/E.2	1) FALL2023 – FALL2025 2)SPRING2023 3)FALL2026

VALIDATION TEAM SIGNATURE PAGE

Patrick McGuire
Patrick McGuire (Sep 14, 2022 20:20 PDT)

Michael Wagner
Michael Wagner (Sep 15, 2022 13:50 PDT)

Sean Abel (Sep 15, 2022 13:55 PDT)

9/19/2022

PR Chem Validation Team signature page

Final Audit Report 2022-09-15

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By:	Florentina Perea (fperea@hancockcollege.edu)
Status:	Signed
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Signer sean.gottlieb@hancockcollege.edu entered name at signing as Sean Gottlieb
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PLAN OF ACTION – Post-Validation

Review and Approval

Plan Prepared By

Dustin Nouri Date: 9/19/2022

_____ Date:_____

_____ Date:_____

_____ Date:_____

_____ Date:_____

Reviewed:

Department Chair* Ashley Wise Date: 9/21/2022

*Signature of Department Chair indicates approval by department of Plan of Action.

Reviewed:

Dean of Academic Affairs

_____ Date: 9/20/2022

Vice President, Academic Affairs

_____ Date: 7/20/23