Department Information

Overview - Directions

List of Contributors

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Signature of Area Dean/Director

Please type the name of the area Dean/Director and the date they reviewed the rest of the document. They may also use this space to provide optional comments.

Shannon Bliss
5/7/18

Thank you for the work.
Questions Regarding Degree and Certificate Programs

A.1 Core Outcome I - Completion

Observing the number of students who got Awards in your program(s) using the Program Award Tool, compared to the College historical trends what insights can you share?

Notes: Is your program an awards producer or a “feeder” program? If you have multiple degrees and/or certificates, please analyze and compare the trends among them.

Over the 5 year period from 2013 to 2018, 50 students were awarded an AS in chemistry for an average of 10 students per year compared to 3900 students awarded an AA/AS degree by the college for an average of 780 per year. Chemistry AS degrees account for 1.3% of degrees awarded. Although an average of 235 students are active in the Chemistry majors courses (CHM 1A, 1B, 12A, 12B) in the Chemistry Program each year, most students take chemistry courses as a pre-requisite or required course(s) for a biology major (CHM 1A, 1B, 12A, 12B, 22) or engineering majors (CHM 1A for most engineering majors, CHM 1A and 1B for some engineering majors, and CHM 1A, 1B, 12A, 12B for chemical engineering majors).

How do you inform potential students about your program? How do students know which courses they should take for your program and in what sequence?

Hartnell website
Hartnell catalog
Panther Days information table
Counseling
Class syllabi and handouts
Instructor websites

A.2 Core Outcome II - Time and Units to Completion

Observing the Time & Units data, what insights do you get from the data in general?

The median time for a student to earn an AS degree in chemistry is 4.8 years compared to 4.4 years for all students who earn an AA/AS degree.

The median units for a student to earn an AS degree in chemistry is 121.5 units compared to 88.5 units for all students who earn an AA/AS degree.
The median time for a First-time student to earn an AS degree in chemistry is 4.6 years compared to 4.5 years for the all First-time students who earn an AA/AS degree. 
The median units for a First-time student to earn an AS degree in chemistry is 121.5 units compared to 92 units for all First-time students who earn an AA/AS degree. 
The median time for a Transfer student to earn an AS degree in chemistry is 4.8 years compared to 4.4 years for all Transfer students who earn an AA/AS degree. 
The median units for a Transfer to earn an AS degree in chemistry is 120 units compared to 74 units for all Transfer students who earn an AA/AS degree. 
32 students earned an AS degree in chemistry in the five year period from 2011 to 2016. The data indicate these students are taking many classes beyond the required 20 units of chemistry (CHM 1A, 1B, 12A, 12B), 8 units of physics (PHY 4A, 4B), and 8 units of math (MAT 3A, 3B), and the 31 units of General Education requirements to earn the AS chemistry degree. 
The additional classes beyond the required courses include prerequisite courses for the required courses, e.g., CHM 22 prerequisite for CHM 1A, and courses to finish a multi-semester sequence, e.g., PHY 4C to complete the PHY 4 series and MAT 3C to complete the MAT 3 series.

Observing the Subject Analysis tool, and focusing on the percentage of capacity of your program, is the college offering enough sections or too many sections of the courses in your program? 
The average % capacity for the 5 year period from 2013 to 2018 is 104.3%. This percentage indicates the college is offering enough sections of the courses in the Chemistry Program.

Does the way the courses in your degree and certificate program are scheduled enable students to take courses when they need them, plan their lives around their classes from one term to the next, and complete their program on time? If it does not, are there any obvious fixes? 
STEM faculty collaborated over several years starting in Spring 2010 to schedule STEM classes (the STEM scheduling grid) to minimize class conflicts for STEM students so students can complete their requirements to transfer to a 4 year university in a timely manner. 
The biggest problem is students taking two or more STEM classes on the last semester before they transfer and having a class conflict. Since STEM courses are scheduled on the same days and times semester to semester, students need to work with their counselors to develop an education plan to schedule their coursework to minimize class conflicts.

How do you work with underprepared students? How do you share the educational resources that are available on campus with all your students? Please give examples of when these resources have worked well and when they have not.
The Chemistry Program promotes all of the Student Services available at Hartnell College, including tutoring and Supplemental Instruction (SI), MESA Program, ACCESS Program, Trio Program, internships and scholarships, DSPS, Early Alert Program, Panther Labs. 
Students who attend SI sessions earn one half to a full grade higher than students who do not attend SI. 
These resources work well for the students who use them. Perhaps the most difficult part is getting students to use the services available to them to help be more successful in their classes. Incentives such as extra credit for participating in the SI sessions, tutoring, and Panther Labs have been offered by some instructors.
A.3 Core Outcome III - Transfer

Observing the number of transfer students from the transfer volume data, what insights do you get from the data in general?

The transfer volume is increasing over the last 10 years to CSU and UC but is decreasing to in-state private and out-of-state colleges, perhaps due to increasing costs.

What interactions do you have with students about transfer options? Please give examples.

STEM jobs require a minimum of a BS/BA degree so the Chemistry Program encourages every student in the STEM track to transfer to a 4 year university to earn a BS/BA degree. Each Chemistry Instructor shares their 4 year university experiences with students to help them with their transfer decisions. The ACCESS and MESA Programs and student clubs schedule field trips to 4 year universities so our students can visit different campuses to explore their transfer options. Undergraduate research opportunities in chemistry exist at Hartnell College and encourage collaboration with students in 4 year universities as well.

How are program learning outcomes aligned with the skills and knowledge students will need to succeed in transferring to baccalaureate degree programs?

The Chemistry Program Level Outcomes (PLO) are:

Upon successful completion of the Chemistry Program, a student should be able to:
- PLO 1: Apply appropriate chemical theories, concepts, principles, methods, and laboratory skills to relevant science and engineering settings.
- PLO 2: Demonstrate competence in chemistry laboratory techniques and experimental methods.

The Chemistry Program Level Outcomes are designed to prepare students with the critical thinking, analytical thinking, and laboratory techniques and skills to be successful for future STEM courses at Hartnell and 4 year universities and to compete for STEM jobs upon graduation.

A.4 Core Outcome IV - Employment

Observing the Employment data, what insights do you get from the data in general?

The Chemistry Program looked at the Employment data for Chemists and chemistry related professions (Biochemists and Biophysicists, Biomedical Engineers, Chemical Engineers, Chemical Equipment Operators and Tenders, Chemical Plant and System Operators, Chemical Technicians).

In 2014, 13,582 jobs existed in the chemistry and chemistry related professions in the Bay Area, Santa Cruz-Monterey region and 167 jobs in these professions in Monterey County and San Benito County. 13,076 (96%) of these jobs are in the Bay Area.

In 2017, 14,861 jobs existed in the chemistry and chemistry related professions in the Bay Area, Santa Cruz-Monterey region and 188 jobs in these professions in Monterey County and San Benito County. 14,307 (96%) of these jobs are in the Bay Area.

Jobs in the chemistry and chemistry related professions increased 9.4% in the Bay Area, Santa Cruz-Monterey region and 12% in Monterey County and San Benito County from 2014 to 2017.

Annual job openings in the chemistry and chemistry related professions are 852 in the Bay Area, Santa Cruz-Monterey region and 11 in Monterey County and San Benito County. 97% of these jobs openings
are in the Bay Area. There are many more jobs and job openings in chemistry and chemistry related professions in the Bay Area than in the Santa Cruz, Monterey, or Benito Counties. The average median hourly earnings in the chemistry and chemistry related professions are $36.02 in the Bay Area, Santa Cruz-Monterey region and $33.95 in Monterey County and San Benito County. The median hourly earnings in these professions are highest in the Bay Area at $38.61 and lowest in San Benito County at $32.93.

How and when do you inform students about prospective employment opportunities?

The Chemistry Program encourages STEM students to pursue internships to gain work experience, job related skills and training to advance their qualifications to transfer to a 4 year university and to compete for STEM jobs. Announcements are made in class when opportunities arise during the semesters or placed on instructor web pages.

How are program learning outcomes aligned with the skills and knowledge students will need to succeed in their future employment?

The Chemistry Program Level Outcomes (PLO) are:

Upon successful completion of the Chemistry Program, a student should be able to:

- PLO 1: Apply appropriate chemical theories, concepts, principles, methods, and laboratory skills to relevant science and engineering settings.
- PLO 2: Demonstrate competence in chemistry laboratory techniques and experimental methods.

The Chemistry Program Level Outcomes are designed to prepare students with the critical thinking, analytical thinking, and laboratory techniques and skills to be successful for future STEM courses at Hartnell and 4 year universities and to compete for STEM jobs upon graduation.

A.5 - Recommendations

Reflecting on your observations and analysis from A.1 through A.4, what recommendations do you have for your program?

The Chemistry Program recommends the Program continue the work and activities to promote student retention and success and prepare students for transfer and employment.

Reflecting on your observations and analysis from A.1 through A.4, what commendations do you have for your program?

The Chemistry Program is doing excellent work to prepare students to transfer, succeed, and compete for STEM employment.
Questions About Previous Activities

B - Questions About Previous Activities

Evaluate the success of each completed activity in Section D.1 (Previously Scheduled Activities) from your Spring 2017 PPA. What measurable outcomes were achieved? Did the activities and subsequent dialog lead to significant change in student learning or program success?

course scheduling grid - we have minimized class conflicts with our improved STEM scheduling grid so students can complete their course requirements in a reasonable time period to transfer.
purchase of equipment and supplies - The Chemistry Program have used grant funds to purchase chemistry equipment and supplies to develop more engaging lab activities for students. These purchases correlate with an increase in enrollment.
Chemistry/Science Academy - The Science Academy is no longer offered due to a lack of funding.
new Science Building planning - The Chemistry Program moved in the Science Building in Spring 2017. This move involved moving our Chemistry Stockroom with associated chemicals, equipment, supplies, and storage areas, and chemistry instrumentation.
additional CHM 22, 23, and 1B sections -
In the five year period from 2013 to 2018, the College increased the number of CHM 22 sections from 20 sections in 2013-14 to 24 sections in 2017-18 with 27 sections offered in 2015-16. This increase in CHM 22 sections accommodated the increase in demand for this course.
The College decreased the number of CHM 23 sections from 2 per year to 1 per year. The decrease in demand for this course was due to the change in the chemistry requirement for some Nursing Programs.
CHM 1B was offered every Spring semester. The College began to offer CHM 1B in the fall semester starting in Fall 2015. In the five year period from 2013 to 2018, the number of CHM 1B sections increased from 2 sections in 2013-14 to 5 sections in 2017-18.
SI for chemistry classes - Supplemental Instruction (SI) sessions for CHM 22, 1A, 1B, 12A, and 12B have been available to students for many years and is funded by the NIH ACCESS Program. When SI Leaders and funds are available, SI sessions are offered for CHM 23 and CHM 60.
purchase of equipment and supplies for new Science Building - The Chemistry Program moved in the Science Building in Spring 2017. Funds were available for the Chemistry Program to purchase new chemistry equipment and supplies, such as hot plates and ring stands, to replace the old equipment in Building N. The Chemistry Program is planning for additional purchases as funding becomes available.
Chemical hygiene plan - A Chemical Hygiene Plan was approved by the Safety Committee on 12/7/16. Dean Bliss is the Chemical Hygiene Officer. The Safety Committee is updating the Chemical Hygiene Plan.
STEMART Lab - ongoing