

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

1 Executive Summary

0 Executive Summary

Summarize your program's strengths, opportunities, challenges, and action plans. This information will be presented to the Board of Trustees. [1000 word limit]

Response Detail

No Response Information to Display

Narrative

The Biology and Health Science Program has a strong tradition of innovation. In the past, we have experimented with honors courses, learning communities, distance education, and field study abroad. In more recent years, we have been at the forefront of participating in statewide initiatives such as C-ID course alignment and Associate Degree for Transfer (ADT) creation, and local initiatives including General Education Pathways. Our program serves a broad range of students, including science majors and general education students. Biology and Health Science coursework is integral not only to the degrees housed in our own departments, but also to degrees and certificates offered in other departments, including Human Services and Kinesiology. Future directions for our program include the creation of a new Career Technical Education (CTE) program in Neurodiagnostic Technology.

The faculty in the Biology and Health Science Program has a strong tradition of campus service. Among the four full-time faculty in this program are the current Academic Senate President, the current chairperson of both the local and district-wide Curriculum Committees, current co-chairperson of the college's Technology Planning Committee, the former Accreditation co-chairperson, the former chairperson of the Institutional Planning Committee, the former Student Learning Outcomes Assessment Coordinator and the former co-chairperson of the Center for Innovation and Excellence in Teaching and Learning. A significant challenge for our program lies in our lack of additional full-time faculty. In particular, we would benefit from a faculty member dedicated to our general education offerings in Biology, which serve more than half of the students in our department each semester.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

2 Program Context

1 Mission

Identify how your program aligns with the college's mission by stating which categories of courses you offer: Career Technical, Basic Skills, Transfer, and/or Lifelong Learning. If your program has a mission statement, you may include it here.

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No Response Information to Display

Narrative

The Biology & Health Sciences program offers general education (GE) and transfer courses, and offers an AS in Allied Health, AS in Biology, AS-T in Biology and AS-T in Nutrition & Dietetics.

MISSION STATEMENT: The Biological & Health Sciences Program provides well-supported, personalized, interactive, and hands-on instruction in the life sciences that is accessible to a very diverse student population. We share our own enthusiasm for biology and use multi-faceted and rigorous approaches to education to help enhance or instill in students a driving curiosity that leads them to fully explore the wonders of the living world. With guidance, personalized instruction, and their own self-motivation and empowerment to learn, students will be prepared for professional programs and more advanced academic degrees in the biological, natural, and health sciences.

VISION: The Biological & Health Science Program incorporates current computer and laboratory technology and methods into our curriculum. We challenge our students to meet the expectations of a rigorous curriculum and challenge ourselves, as faculty, to maintain high educational standards and to stay current in the biological and health sciences. To meet the challenges of a continually diversifying and ever-growing student population, we continue to look forward and plan consistent evaluation and modifications to our curricula. We provide continually updated methodologies and equipment to meet the burgeoning employment demands of the community and to prepare students seeking degrees and employment in the biological, natural, and health sciences.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

2 Articulation

Are there changes in curriculum or degree requirements at high schools or 4-year institutions that may impact your program? If so, describe the changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes".

Response Detail

No Response Information to Display

Narrative

We have already adopted the existing Transfer Model Curriculum (TMC) templates for Biology and Nutrition & Dietetics and have approved Associate in Science Degrees for Transfer (AS-T) in both fields. Additionally our courses are major components of the Associate in Arts Degree for Transfer (AA-T) in Kinesiology. We don't anticipate any further changes in articulation with the CSUs for the near future.

Suggested Follow Ups

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No Suggested Follow Ups to Display

3 Community and Labor Needs

Are there changes in community needs, employment needs, technology, licensing, or accreditation that may affect your program?. If so, describe these changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes". CTE programs: identify the dates of your most recent advisory group meeting and describe your advisory group's recommendations for your program.

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No Response Information to Display

Narrative

In summer 2016 Dean Stringer was approached by UCSF to discuss the possibility of creating a partnership between the two institutions for the purposes of creating a new associate's degree training program in Neurodiagnostic Technology (NDT). There are only two such training programs on the west coast (southern California and Washington) and none in Northern California. UCSF performs the greatest number of neurodiagnostic procedures in the Bay Area with Stanford Hospital coming in second. As the new standard for NDTs is an associate's degree, UCSF foresees significant demand for a community college program.

Biology faculty members and Dean Stringer saw this as a perfect model of responding to labor market needs and forming community partnerships. We fully supported the proposal and immediately began planning action steps for new program development including working with the Workforce Development Director, Alex Kramer, to submit a proposal requesting support from the Strong Workforce Program local shares. In January 2017, the college allocated \$32.7K from the Strong Workforce Program to support curriculum development by an adjunct faculty discipline expert. To date, curriculum is progressing and discussions are occurring about staffing and equipment. We anticipate the first cohort of students to begin the program in January 2018.

The prerequisites to the program include our existing courses (BIOL 250 Human Anatomy, BIOL 260 Human Physiology) and parallel those already in place for Cañada's Radiologic Technology program as well as most local nursing programs.

Consequently, the NDT program will offer our existing students a new, additional option when they complete their allied health prerequisite coursework and apply for subsequent training.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

3 Looking Back

4 Curricular Changes

List any significant changes that have occurred over the prior two years in your program's curricular offerings, scheduling, or mode of delivery. Explain the rationale for these changes.

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Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology
Since our 2014-15 program review, our AS-T in Biology and AS-T in Nutrition & Dietetics have been approved by the state Chancellor's office and are being offered. The creation of these degrees did not require the creation of any new courses or the significant modification of any existing courses.
The disciplines of Biology (BIOL) and Health Science (HSCI) are currently undergoing their five-year Curriculum Update Cycle, which requires the review and update of all currently active courses and programs in these disciplines. At the time of this report, none of the courses updated thus far in either discipline have required major revisions.
BIOL 100 Introduction to Life Sciences, when taught by Prof Barry Thomson, is part of the Sustainability Pathway for General Education courses.
BIOL 130 Human Biology/BIOL 132 Human Biology Laboratory is included within the College for Working Adults program. The district prerequisite of BIOL 225 Biology of Organisms before BIOL 230 Cell and Molecular Biology continues to create challenges for students because the content of BIOL 230 is a foundation for topics in BIOL 225. Waivers can be signed to allow students to take these courses in reverse order (BIOL 230, then BIOL 225), but at most, half of the BIOL 225 students actually do it this way.
This is the 6th year that BIOL 230 Cell and Molecular Biology has been offered in the spring, in addition to its historical place as a fall course for more than 40 years. Also, spring sections of the course have been very full for the last two years, and so two sections (morning lab and afternoon lab, with combined lecture) were offered for the first time in 5 years for Spring 2017. 48 of 60 possible seats (80%) are currently filled, which is very respectable for the Biology Majors courses on our campus. We look forward to the continued growth of the BIOL Majors program, especially with the coming of the new Science building in the next few years.
The prerequisites for BIOL 250 Human Anatomy were updated in an ongoing attempt to align prerequisites for Human Anatomy courses across the district.

Health Sciences
The Health Sciences discipline is undergoing a re-envisioning process at this time. Due to changing student needs and interests, we have banked several HSCI courses since our last program review. These include:
HSCI 104 Nutrition and Physical Fitness
HSCI 105 Communicable Disease
HSCI 430 First Aid
HSCI 432 CPR: Adult, Child and Infant for Healthcare Providers
HSCI 104 and HSCI 105 were 1.0 unit courses that were offered infrequently and did not meet student needs due to their low unit load. HSCI 430 and HSCI 432 were banked due to loss of the faculty member primarily responsible for teaching them and because 432 required a 1:9 teacher-student ratio (American Heart Association standard) which was financially not feasible for the college.
Faculty are exploring options for reinvigorating this discipline, including collaborations with the Early Childhood Education (ECE.) and Human Services (HMSV) disciplines to create program offerings geared toward students interested in public health, and the creation of Learning Communities that tie together HSCI courses with courses in the Division of Humanities and Social Sciences (e.g. a HIST 247 Women in U.S. History/HSCI 116 Women's Health Issues Learning Community).
During the Fall 2016 and Spring 2017 semesters, Dani Behonick's sections of HSCI 100 General Health Science were taught as part of the Social Justice General Education Pathway.

Suggested Follow Ups

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No Suggested Follow Ups to Display

5.A. Progress Report - IPC Feedback

Provide your responses to all recommendations received in your last program review cycle.

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Response Detail

No Response Information to Display

Narrative

Below are the feedback we received in March 2015:

Recommendation/Feedback: Executive Summary - "No Executive Summary Included"

Response: We regret our omission. We have included an executive summary this cycle.

Recommendation/Feedback: Articulation - "More information needed about HS articulation."

Response: We did not, and do not, have courses articulated with the high schools at this time.

Recommendation/Feedback: Progress & Completion - "Need to share concerns about Hispanic and African American students with the ACES committee."

Response: This continues to be a concern in our Program, and we are making plans to work with ACES members and the STEM/MESA Center to better prepare and support our Hispanic and African American students.

Recommendation/Feedback: SLO Assessment - "For Health Sciences, 4 of the 7 courses do not have assessment results on record. An examination of support is needed especially where adjunct faculty are concerned."

Response: The 4 courses that had no SLO assessment data on record in TracDat as of our 2014-2015 Program Review were the following:

HSCI 104 Nutrition and Physical Fitness

HSCI 105 Communicable Disease

HSCI 430 First Aid

HSCI 432 CPR: Adult, Child and Infant for Healthcare Providers

All of these courses were banked through the curriculum review and approval process during the 2015-2016 academic year, with an effective date (removing them from the Cañada College catalog) of Fall 2016. In addition, HSCI 115 Introduction to Health Care and the Health Professions, which was noted in our 2014-2015 Program Review as having only 2 of its 5 SLOs assessed once in the 4 years prior, was banked in the Fall 2016 semester with an effective date of Fall 2017.

Recommendation/Feedback: PLO Assessment - "More description on discussion on results needed."

Response: We intend to improve our presentation of PLO results discussion in this round of Program Review and to re-strategize a more effective method for PLO assessment.

Suggested Follow Ups

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No Suggested Follow Ups to Display

5.B. Progress Report - Prior Action Plans

Provide a summary of the progress you have made on the strategic action plans identified in your last program review.

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Response Detail

No Response Information to Display

Narrative

Progress on Action Plan 1: Carol Rhodes (FT) and Susan White (PT) participated in several training sessions, online and off-campus, and consult periodically on implementation of RA strategies in BIOL 130. This academic year, the effort was combined with ACES Community of Practice to include more faculty and broaden the scope of teaching strategies beyond RA. An ongoing challenge is to evaluate the impact of any changes in instructional practices.

Progress on Action Plan 2: The required resources have not been provided to make progress on this plan. The biology program has presented its case for hiring a new FT faculty member in Spring 2015, Fall 2015, Spring 2016 and Fall 2016. The goal of the proposal is to have a FT faculty who can be devoted to innovating in non-majors courses, supporting Honors, GE pathways and CWA courses. Despite having the capacity to fully support more than 3 FTEF above our current number of full timers, and despite receiving college and faculty support, the president has failed to approve this position. We will continue to present our case.

Progress on Action Plan 3: This strategy meeting occurred during the Spring 2015 semester. Attendees brainstormed possible options for reinvigorating the Health Sciences program, including collaborations with the Human Services (HMSV) program and development of the Associates Degree for Transfer (ADT) in Public Health Science. A subsequent meeting to discuss a collaboration between the Early Childhood Education (ECE.) and Human Services (HMSV) programs was held during the Fall 2016 semester. Options are currently being explored further as the Biology (BIOL) and Health Sciences (HSCI) disciplines complete the Curriculum Update Cycle process.

Progress on Action Plan 4: This strategy meeting has not occurred and is deferred until next year when both FT A&P instructors are no longer on reassignment.

Progress on Action Plan 5: The new Equity Supplements and Effectiveness data packets provided by the PRIE office provide the needed information. To date we have not had the opportunity to fully analyze these data.

Action Plan	Timeline	Responsible party	Resources required
1. Biology			
Professional development - FT and PT faculty involved in Reading Apprentice program, across disciplines of science and math.	Spring 2015 and summer 2015 training.	course modified	Fall 2015 Carol Rhodes and other PT with Denise Hum (Math)
	time for training and discussions with colleagues on incorporation into classes		
2. Renovate Bio 100 to attract and benefit more non-majors; develop honors addendum			
	When new FT gets hired	New FT faculty	
	New FT faculty		
3. Health Science Strategy Meeting		Currently being planned for Spring 2015 semester.	New strategy re: course offerings, SLO assessment, overall departmental organization to be implemented beginning Fall 2015. Dani Behonick, Doug Hirzel, Janet Stringer n/a
4. Anatomy & Kinesiology faculty strategy meeting to identify strategies to improve success of student athletes and kinesiology majors		Meeting will occur during spring 2015 and into summer 2015; pilot interventions in 2015- 16 if resources are available	Doug Hirzel, Dani Behonick, Coaches Resources not needed for meeting but resources will likely be needed for any interventions
5. Use Data Dashboard to disaggregate student achievement data into majors/allied health/non-majors to more clearly identify existing gaps		Summer 2015; discussion of significance and plan possible interventions during 2015-16	Doug Hirzel possible assistance from PRIE

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6.A. Impact of Resource Allocations

Describe the impact to-date that new resources (equipment, facilities, research) requested in prior years' program reviews have had on your program. If measurable impacts on student success have been observed, be sure to describe these and include any documentation/evidence. If no resources have been recently requested, please write "not applicable?".

Response Detail

No Response Information to Display

Narrative

The acquisition of new and replacement anatomy models and increased numbers of existing models has enhanced our ability to teach anatomy by helping students tangibly visualize and handle anatomical structures. In some cases, students are now able to work in pairs to study a particular model rather than having only 1-2 for the whole class to share.

The acquisition of an incubator (for Drosophila in BIOL 225 Biology of Organisms) has allowed better timing for this 2-week lab and more uniform results among replicate experiments.

The acquisition of a replacement spectrophotometer has allowed BIOL 230 Cell and Molecular Biology to continue to support full and nearly-full laboratory sections, which require all 8 of our UV-Vis Spectrophotometers for efficient execution of most lab experiments for each semester.

The acquisition of replacement microcentrifuges allows efficient preparation of samples for performing experiments in BIOL 230 Cell and Molecular Biology and BIOL 240 General Microbiology laboratories.

The acquisition of replacement microscope slides for BIOL 132 Human Biology Lab and BIOL 250 Human Anatomy has permitted more students to work more efficiently through these portion of the labs that use these slides.

The acquisition of replacement microscopes for BIOL 250 Human Anatomy and BIOL 260 Human Physiology eliminated antiquated scopes for which replacement parts were no longer available.

Suggested Follow Ups

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No Suggested Follow Ups to Display

6.B. Impact of Staffing Changes

Describe the impact on your program of any changes in staffing levels (for example, the addition, loss or reassignment of faculty/staff). If no changes have occurred, please write "not applicable".

Response Detail

No Response Information to Display

Narrative

We have not been approved to hire a new full time biology faculty member. We continue to submit proposals: Spring 2015, Fall 2015, Spring 2016, Fall 2016.

Beginning Fall 2017 both Dani Behonick (Curriculum Committee Chairperson, Spring 2014-present) and Doug Hirzel (Accreditation Co-chair and Academic Senate President, Fall 2011-present) will return to full time instruction. We look forward to the freedom to focus on teaching and learning.

We are very concerned over the administration's decision to continue renting the biology lab to UC Berkeley Extension despite faculty and staff's decision to the contrary. As of the writing of this document we are in the process of quantifying the costs (supplies, personnel, and equipment wear/tear) related to the rental. We will make every effort persuade the administration to ensure these costs are covered above our normal budget and as overtime for our staff.

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4	Current State of the Program
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7	Enrollment Trends
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Use the Productivity data packet to examine your enrollments (headcount, FTES, Load) and pattern of course offerings (Productivity by Courses by Semester). How have your enrollments changed? What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections), marketing, and articulation of pathways that might improve these trends? NOTE: If other sources of data are used, please upload these documents or provide URLs.

Response Detail

No Response Information to Display

Narrative

Biology

Consistent with the trend in our last analysis in 2015, course enrollments in BIOL have declined gradually since the peak in 2011/2012 (2,482 headcount). However, the trend has leveled-out in the last two years, to 1930 and 1945 respectively. Section offerings have been accordingly reduced (from 84, 5 years ago, to mid-60s in the last 2 years) to maintain a consistent Fill Rate of about 85%-89% in the Department over the last 5 academic years. Similarly, FTES and load 5 years ago were 459 and 606 respectively, and declined for 3 years until leveling at near 330 and 534 respectively for the last two years. These trends again parallel the 5-year college-wide enrollment and productivity trends, where headcounts/FTES/loads have declined from 39K/4.6K/540 to 35K/4.1K/485 in the last two years, but have not yet leveled as BIOL has. College-wide fill-rates are lower than BIOL, however, fluctuating between 75% to 82% last year as sections have been reduced. BIOL courses tend to be well-enrolled when section offerings are monitored. Dean Janet Stringer has done a wonderful job at this.

As discussed two years ago, college and BIOL enrollments may be in decline as potential students may choose to defer higher education for a while as job availability rose strongly in the bay area 2-3 years ago and continues to stay strong, as noted in several articles by George Avalos of the San Jose Mercury News in late 2016 (e.g.: see <http://www.mercurynews.com/2016/09/28/forecasts-bay-area-job-market-economy-poised-to-shine/> ; and <http://www.mercurynews.com/2016/11/18/strong-job-gains-are-reported-for-october-in-california/>).

Interestingly, BIOL headcounts (and FTES and loads) for the last 5 years have been higher in the Fall than in the Spring semesters (by about 50-100 heads), while the Majors Courses, BIOL 230 Cell and Molecular Biology and BIOL 225 Biology of Organisms, traditionally have higher enrollments in the Spring. This was a major reason for offering a 2nd section of BIOL 230 for the first time this spring 2017 -- and the 2 sections filled nearly 80%.

Also, while Fall and Spring semesters show higher fill rates in day sections more than night sections (often by 10%-15%age points), during the summers, fill rates during Summer sessions for the last 3 years have demonstrated higher fill rates for evening sections -- by 10%age points or more. Load has been significantly higher too in summer evenings. Evening section offerings have been very limited in the Summer so far, so this may indicate that more BIOL sections could be offered in summer evenings.

To be completely honest, it is VERY difficult to look at and make sense of the course-by-course data. We would very much like to request that this data in the packets be also supplied in graphical format by course, from semester to semester, with lines for each data type. Until a few years ago, such data had been presented graphically too. As it is, not much can easily be done with these tables that is comprehensible and useful. We offer 10-11 courses every term, and if the data is organized only by semester, and each course is not presented side-by-side with itself across semesters, our ability to clearly see meaningful trends is greatly hindered. Also, perhaps data can also be provided in spreadsheet (MS Excel?) format, so that we may do some of our own tabulated and graphical comparisons as well and make the data much more intelligible.

That being said, with occasional minor adjustments in number of sections offered, fill rates and loads for most courses have been consistent semester-to-semester and year-to-year. Introductory courses, such as BIOL 100, 110, and 130 consistently command high loads in the 500 to upper 700 range, with Human Biology (130) breaking 200 headcount. In the Health and Biol Majors courses, the allied health prerequisites, especially BIOL 250 (Anatomy) and BIOL 260 (Physiology), are also consistently strong performers in the upper 500 load range. BIOL 250 and 260 also have headcounts approaching and sometimes surpassing 150, depending upon the number of sections offered. Microbiology, BIOL 240, fluctuated more than the other Allied Health prerequisites (250 and 260), with load above 700 in 2011 and 2012, but dropping to high 400s in fall 2013-2015 and spring 2014-2016. BIOL 240 loads remained in the high 400s through spring 2016. Besides the noted risen job market, drops in BIOL 240 since 2014 could have partially resulted from full-time faculty not being assigned to this course during most of those terms. Our full-time faculty do have very good reputations in the department, and are a draw to students throughout the District. We have noticed drops in 200-level course enrollments before when fewer FT faculty are assigned these sections.

For the core Biology Majors courses, BIOL 225 (Organismal Biol.) and BIOL 230 (Cell/Molecular Biol.), BIOL 230 has had the most consistent enrollments (headcounts from 25-33 most years, and several semesters above 100% fill rate; 584 load), including 107% fill rate for the single section in the last two springs. BIOL 225 enrollments fluctuate much more, from 16 (twice; 277 load) to 31 in headcounts (537 load) for the last 10 semesters, likely because the course is only required for the BIOL AS degree, and is rarely a prerequisite for pre-Medical and some other (eg: pharmacy, pharmacology, physical therapy, nurse practitioner) healthcare-related programs (a large number of our BIOL 2XX students), as BIOL 230 often is. As BIOL majors requirements, these courses will continue to be offered every semester, with occasional offerings of 2 sections of BIOL 230 as necessitated by student demand.

Health Science

As noted in several previous sections of this report, Health Science is currently in the process of re-envisioning its place on the Cañada campus. Evidence of this can be seen in enrollment data since our 2014-2015 Program Review and even before. The clearest indicator of changes in this department is the steady decline in the number of sections of Health Science courses offered at Cañada since the 2011-2012 academic year. Whereas 24 sections of Health Science courses were offered during the 2011-2012 academic year (with a census headcount of 649 in the discipline as a whole), only 6 sections of Health Science courses were offered during the 2015-2016 academic year (with a census headcount of 145 in the discipline as a whole). Several factors have contributed to this decline, including the retirement of an adjunct faculty member who taught the majority of our first aid-related courses and all Health Science courses offered in Spanish, the loss of concurrent enrollment courses in this discipline at collaborating high schools, and the proliferation of courses in general education area E which compete with Health Science course offerings for students.

The most dramatic change in enrollment in Health Science (HSCI), as reflected by census headcount, can be seen between the

Spring 2015 and Fall 2015 semesters. In Spring 2015, census headcount was 239 while in Fall 2015, census headcount was 61. FTES and load stayed relatively consistent between these semesters: in Spring 2015, FTES was 5.97 and load was 269; in Fall 2015, FTES was 5.63 and load was 287. Reviewing the courses offered and successfully run for the discipline according to the Spring 2015 (http://canadacollege.edu/catalogschedule/schedules/Spring15_web.pdf) and Fall 2015 Schedules of Classes (<http://canadacollege.edu/catalogschedule/schedules/fall-2015.pdf>) and the data packets provided by the office of Planning, Research and Institutional Effectiveness suggests the reason for this.

During Spring 2015, the following courses were offered and run successfully in the discipline:

HSCI 100 General Health Science, 2 sections

HSCI 104 Nutrition and Physical Fitness

HSCI 430 First Aid

HSCI 430 Primeros Auxilios

HSCI 432 CPR: Adult, Child, Infant for Healthcare Providers, 2 sections

HSCI 432 CPR Para Proveedores del Cuidado de la Salud

*1 section of HSCI 116 Women's Health Issues listed in Spring 2015 Schedule of classes, cancelled due to low enrollment

During Fall 2015, the following courses were offered in the discipline:

HSCI 100 General Health Science

*1 section each of HSCI 430 First Aid, HSCI 430 Primeros Auxilios, HSCI 432 CPR: Adult, Child, Infant for Healthcare Providers and HSCI 432 CPR Para Proveedores del Cuidado de la Salud listed in Fall 2015 Schedule of classes, cancelled due to departure of teaching faculty

While at least one section of HSCI 430 and 432 in both English and Spanish was originally listed in the Fall 2015 Schedule of Classes, these course sections were cancelled due to the departure of their instructor, who accepted a teaching position in another state. As compared to the Spring 2015 semester, in which 8 sections of Health Science courses ran, during the Fall 2015 semester, only 1 section of Health Science courses ran, resulting in the dramatic contraction of offerings in this discipline. This also dramatically impacted the fill rate data for the Fall 2015 semester (58.1%). Since this time, 1 section of Health Science courses (HSCI 100 General Health Science) has been offered and run successfully each semester, taught by the only full-time faculty member in this discipline, who is shared with the Biology department. Fill rate for HSCI in the Spring 2016 semester was 80.0%.

At this time, student needs and interests must be more fully assessed before further curriculum development and scheduling changes are attempted in this discipline.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

7.A. Connection & Entry - Observation

Observation: Describe trends in program and course enrollments, FTES, LOAD and Fill Rates. Cite quantitative data and identify the specific tables from the data packets. If other sources of data are used, please upload these documents or provide URLs.

Response Detail

No Response Information to Display

Narrative

Biology

Enrollment in BIOL courses increased from 2151 in 2009/10 to 2433 in 2011/12. However, enrollments again steadily declined to just 2104 again in 2013/14 (Success and Retention 2009/10 through 2013/14 document, Tables: Course Success and Retention Annually, & By Semester). This same trend is still apparent when observing Student Characteristics 2009/10 through 2013/14 Biological Science document, Annual Unique Headcount table: unique head count rises from over 1672 in 2009/10 to through 1821 in 2011/12, but declining again down to 1602 by 2013/14.

These recent declines mirror trends in college-wide enrollments for the last two academic years (Cañada College Success and Retention 2009/10 through 2013/14 document, in the tables Course Success and Retention Annually and By Semester), presumably losing students to the rising job markets (see George Avalos's Nov. 2014 article, "Bay Area job market surges in October and the boom is likely to continue for two years," http://www.mercurynews.com/business/ci_26985531/bay-area-job-market-surges-october, and related articles from the San Jose Mercury News). Notice that the job trends and times of the declines and inclines almost exactly inversely correlates with the our Dept. and campus-wide enrollment patterns.

As with overall enrollment and headcounts, FTES, Load, and Fill Rates in BIOL have experienced declines during the last two academic years (Productivity 2008/09 through 2013/14

Biology document: Productivity By Year and By Semester tables) following several years of steady rise. FTES declined from a rise to 421 in 2010/11, down to 300 in 2013/14. Load declined from a peak of 691 in 2010/11 to 531 in 2013/14. Fill rates declined from a peak of 94% in 2010/11 down to 83% in 2013/14. Again, these recent declines mirror the trends in overall campus FTES, Load, and Fill Rates during the same years (Cañada College Productivity 2008/09 through 2013/14 document: Productivity By Year and By Semester tables). Declines in these categories might largely be attributed to rising job market opportunities in the Bay Area as noted above, reducing enrollments and to resulting reductions in BIOL sections, losing 12 sections from 2010/2011 to 2013/14 (Productivity 2008/09 through 2013/14 Biology document: Productivity By Year and By Semester tables).

Health Science

Enrollment in Health Science courses increased from the 2009-2010 academic year to the 2010-2011 academic year, but has declined steadily since the 2010-2011 academic year (Annual Unique Headcount of 563 in 2010-2011 as compared to 417 in 2013-2014; Annual Unique Headcount Table, Student Characteristics 2009/10 through 2013/14 Health Science document). This decline mirrors that observed for the college overall, which also showed a decrease in Annual Unique Headcount since the 2010-2011 academic year (11,560 in 2010-2011 as compared to 11,178 in 2013-2014; Annual Unique Headcount Table, Student Characteristics 2009/10 through 2013/14 document). There are several additional factors which likely contributed to this trend including the loss of concurrent enrollment courses in this department during this time period (see "Currently K-12" group in Student Enrollment Status Table, Student Characteristics 2009/10 through 2013/14 Health Science document), as well as the cancellation (due to low enrollment) of HSCI 116 during the Spring 2012, Fall 2013 and Spring 2014 semesters (which resulted in the running of 1 less HSCI course during the affected semesters).

FTES and LOAD in Health Science have declined since the 2009-2010 academic year (FTES: 38.8 in 2009-2010 as compared to 21.64 in 2013-2014, LOAD: 601 in 2009-2010 as compared to 443 in 2013-2014; Productivity by Year Table, Productivity 2008/09 through 2013/14 Health Science document). This trend mirrors that observed for the College overall during this time period (FTES: 4615.26 in 2009-2010 as compared to 3736.49 in 2013-2014, LOAD: 606 in 2009-2010 as compared to 478 in 2013-2014; Productivity by Year Table, Productivity 2008/09 through 2013/14 document), although the specific fluctuations seen between the 2009-2010 and 2013-2014 academic years are different between the Health Science department and the College as a whole.

Fill rates for the Health Science department were higher than those observed for the College overall for all but 1 of the academic years assessed (2009-2010: HSCI 78.5%, Cañada 77.2%; 2010-2011: HSCI 94.7%, Cañada 86.0%; 2011-2012: HSCI 77.5%, Cañada 80.0%; 2012-2013: HSCI 80.4%, Cañada 77.0%; 2013-2014: HSCI 74.5%, Cañada 70.0%; Productivity by Year Table, Productivity 2008/09 through 2013/14 Health Science document, Productivity by Year Table, Productivity 2008/09 through 2013/14 document).

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

7.B. Connection & Entry - Evaluation

Evaluation: What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections), marketing, and articulation that may improve these trends in enrollment?

NOTE: If you intend to implement any of these changes, you should create Action Plans in the Planning module of SPOL. Doing so will also allow you to request resources that may be required for successful implementation.

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology

Introduction of online sections of Bio 100 and Bio 310 may increase enrollment for these courses. The current initiative for GE Thematic Pathways may enable sections of these courses to have perspectives that would fit with chosen pathways, which might increase enrollment.

Aside from the GE Pathways efforts, special sections of these GE courses could be designed to appeal to students interested in particular approaches. For example, Prof Hirzel adapted Bio 100 curriculum around a theme of sustainability when he taught this course several years ago. This revision of curriculum would take concerted effort by an instructor dedicated to this course, and right now adjunct instructors rotate responsibility for this course.

Also, introducing more morning lectures and laboratories, begun in fall 2014 for BIOL 260 as mentioned earlier, will provide more scheduling opportunities for students and instructors.

Certainly, more active marketing and outreach at campus Majors Days and Club Days, as well as more direct communication with local high schools could help fill and expand our program offerings. Perhaps the college Marketing and Outreach staff could create suitable hard-copy materials for these events that promote biological sciences.

Other options include more online offerings for lecture courses, as has begun with BIOL 100 and BIOL 310, that could reach more students with restricted schedules. Enrollment in hybrid sections of BIOL 110 have been steady for several terms.

Health Science

The Health Science department has experienced trouble in successfully offering new courses. HSCI 116 Women's Health Issues, which was created in 2012, has thus far been offered during 6 semesters but has run successfully only twice. Despite initially perceived demand, transferability, general education fulfillment and the fact that the course is a selective for all degrees currently offered in the Biology department, it has failed to gain traction on this campus. A re-strategizing effort for this course and the Health Science department as a whole is currently being planned (see section 11).

While a TMC in Public Health Science is currently being considered at the state level, it is unclear whether such a degree could be offered on our campus. As currently structured, this transfer degree would require the creation of at least one new Health Science course (Introduction to Public Health) and it is unclear whether sufficient demand for such a course/degree exists at Cañada.

Additional considerations for increasing enrollment in Health Science include the following:

- ? creation of new courses tailored to more specific student populations (e.g. student-athletes, kinesiology students)
- ? development of online sections of regularly-offered HSCI courses (e.g. HSCI 100)
- ? packaging of HSCI courses into GE pathways currently in development to boost enrollment. this strategy is being considered specifically for HSCI 116, which may be particularly suited to GE pathways that focus on Diversity Studies or Gender & Sexuality.

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

8-A. Access & Completion

One of the goals of the College's Student Equity plan is to close the performance gaps for disproportionately impacted students. The Equity Supplement data packet indicates which groups are experiencing disproportionate impact in your program. Which gaps are most important for improving outcomes in your program? How can the college help you address these gaps? What changes could be made?

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology
According to the Equity Supplement analysis there is a significant access equity gap for male students (7.7%). This finding is not surprising as the majority of our program enrollment is in Allied Health prerequisites. Nursing is the dominant profession within Allied Health and has historically attracted significantly more females than males. Given this context, it will be difficult for us to address the access gap. Nevertheless, we are in the process of developing a Neurodiagnostic Technology degree program that may attract more male students similar to Radiologic Technology which has an equity gap of only 4.4%.

The other major access equity gaps in BIOL are Hispanic males, with a gap of -3.6% as compared to college-wide access. This likely falls in line with the general male student gap, since allied health students make up such a large portion of our students, and they are very predominantly female nation-wide, as discussed by Trish Joyce (2015) at [healthcareers.com](https://www.healthcareers.com/article/healthcare-news/does-healthcare-have-a-gender-problem) (<https://www.healthcareers.com/article/healthcare-news/does-healthcare-have-a-gender-problem>). As far as the Hispanic side of the Hispanic male gap, it's hard to determine where and how this can be addressed without knowing which courses contribute most to the gap: Introductory courses (BIOL 100/110/130), Allied Health prerequisites (BIOL 240, 250, 260), or BIOL/Science Majors courses (BIOL 225, 230). Also, access gaps are significant in Physical Sciences (Chemistry and Physics) as well as Engineering, so sciences in general seem to present an access problem for Hispanics, and males in particular for Biology. More active discussions and work must be done with the ACES committee and STEM/MESA program, about how to make Biological Sciences courses more attractive to and provide better preparation and support for Hispanic male students.

Significant course completion/success equity gaps exist among Black/African American students (-18.5%), Hispanic Students (-8.9%), and Pacific Islander students (-11.1%). Again, it is difficult to determine how and where to address these gaps without knowing whether they derive mostly in the introductory, pre-allied health, or BIOL Majors courses -- or across all BIOL Dept. courses. As mentioned, Hispanic students tend to struggle in the sciences in general, but gaps in Black and Pacific Islander students seem particular to Biology among the sciences. Instructors in the Biological Sciences need to be particularly aware and attentive with support and encouragement for these groups, and actively try to facilitate their greater success. Perhaps these groups have fewer Science/Biology role models to serve as inspiration, encouragement, and confidence-building models of success from their own ethnic backgrounds. Again, more active discussions and work must be done with the ACES committee and STEM/MESA program to improve the preparation and continued support for Hispanic, Black and Pacific Islander students in Biological Science courses. Also, finding more Black, Hispanic, and Pacific Islander STEM professionals for the STEM Speakers Series may help more of these ethnic minorities find inspirational role models in Biological Sciences, as well as Physical Sciences and Engineering.

Health Science

According to the equity supplement analysis, the groups experiencing equity gaps in program access in Health Science are males and white students. As males and white individuals are two of the most privileged groups in society, the full-time faculty member in this discipline suggests that this result points to the Health Science discipline's effectiveness at serving students from less privileged groups in society.

According to the equity supplement analysis, no groups are experiencing equity gaps in program course completion rates in Health Science.

Addressing other aspects of Access

The faculty who teach BIOL 260 have opted to participate in the bookstore's new Inclusive Access program. The intent of this program is to reduce the cost of textbooks that required access codes for publisher's digital content. Through Inclusive Access, students are now able to receive their textbook and online access to MasteringA&P for \$89 compared to over \$225 outside of the new program. Even if students choose to purchase the optional paperback version of the textbook (\$49), the final price is still a substantial savings. We hope that by participating in Inclusive Access we will reduce one of the barriers to student access in this class.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

8.A. Progress & Completion -Observation

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Observation: Describe trends in student success and retention disaggregated by: ethnicity, gender, age, enrollment status, day/evening. Cite quantitative data and identify specific tables from the data packets. If other sources of data are used, please upload these documents or provide URLs.

Response Detail

No Response Information to Display

Narrative

Biology

Overall Success and Retention in our BIOL courses have fairly consistently been around 67% success and 81% retention, with recent dips in 2013/14 to 63% and 78% respectively (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Annual Retention and Success table). Comparatively, campus-wide success has stayed consistently at about 70% Success and 84% Retention, a few points higher than in BIOL courses (Cañada College Success and Retention 2008/09 through 2013/14: Course Success and Retention Annually table).

The Retention and Success by Ethnicity table reveals that for the last 5 years among our greatest ethnic populations (White, Hispanic, Unknown, and Asian respectively and historically), 70-76% of white students are successful and 81-86% are retained, with dips of about 5 percentage points in the last year or two. "Unknown" students' success and retention is close to that of White students. Hispanics have much lower success at 49-57% with recent rises, and retention at 73-78% with recent slight declines. Clearly, success and retention of our Hispanic students needs to be better addressed by providing as much support and preparation as possible before and during enrollment in BIOL courses. Asian students succeed in BIOL courses 73-84% (most commonly around 77% in the last 4 years), and Asian retention is 83-90% for the last 5 years, mostly in the high 80%. Asian students are a very successful and dedicated group. Filipino student success has fallen from 75% to 64% in the last three years, and their retention has fallen from 85% to 77% in the same time. Students who identify as coming from African American descent have had varied success between 41% and 56% for the last 5 years, and their retention varied between 63% last year and 79% in 2010/11. Native American student trends are difficult to pinpoint due to very low enrollments in BIOL (ranging from only 3-9 students per entire academic year).

The Retention and Success by Gender table shows that female student success has declined from 77% to 63% in recent years, and their retention rate Male student success consistently trails a few percentage points behind female students, varying between 60% and 67% , and their retention rate has held consistently between 78% and 82%, trailing just behind female students. (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Retention and Success by Gender table). These trends are consistent with overall student Success and Retention trends.

Enrollments in BIOL have been consistently about 67% female and 31% male for the last 5 years (Student Characteristics 2009/10 through 2013/14 Biological Science document: Student Gender, Age and Ethnicity tables). This trend of female predominance in the BIOL program (7 percentage points higher than campus-wide) is even more pronounced than the national averages in recent years, as reported by Eddy et al. article in Life Sciences Education from May 2014, "Gender Gaps in Achievement and Participation in Multiple Introductory Biology Classrooms" (<http://www.lifescied.org/content/13/3/478.full>). Results in this study demonstrate the continuing trends of female predominance in choosing biological/health majors in college (and also in class participation), consistently near 60% female in Life Science majors. This trend holds only for the Life Sciences, while other STEM majors are predominantly male.

The campus and BIOL program's predominant age group, 18-22 years, has had only a 54%-63% success rate in recent years, while the next two age groups, 23-28 and 29-39 (also high enrollment groups) succeed at a nearly 15-20 percentage points higher rate (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Retention and Success by Age table)! It seems apparent that the more recent high school graduates require much better guidance and preparation for college BIOL courses (see suggestions in Part C below). However, the retention rate among this young predominant age group is still good, from 76-80% retention, very close to the next two age groups.

Perhaps consistent with the struggles of our younger age groups mentioned above, First-Time Student enrollees have struggled with low success rates, 46-56%, but this has improved to about 65% success in the last two years (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Retention and Success by Enrollment Status table). This might be attributed to better and more pro-active counseling services on campus, and better prerequisite checking across the District. Returning Students have also struggled with low-mid 60% in success, and so more counseling intervention is likely needed with these students as well. Both of these student groups also struggle college-wide (Cañada College Success and Retention 2008/09 through 2013/14: Retention and Success by Enrollment Status table). Retention rates of BIOL students in these two groups are decently comparable to other groups at 78-83%, including rises in the last 3 years.

Retention Rates have remained consistent between Day and Evening enrolled students, at 79-82% for the last 5 years. However, Success Rates have varied, showing notable declines from 77% to 60% in evening classes (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Retention and Success by Day or Evening courses table). More active effort is needed to ensure that quality instruction and student support continue reach our large population of evening students!

Web Assisted Courses, such as BIOL 260 and some sections of BIOL 110 and 130 demonstrate great 70-84% success rates and 84-91% retention rates (Success and Retention 2009/10 through 2013/14 Biological Science Department document: Retention and Success by Distance Ed Description table), nearly 10 points higher than standard face-to-face only courses, but success declined significantly in the last 2 years. These combinations of face-to-face instruction and also extensive online activities are working very well for students, though the declines must be addressed. Standard non-online courses have roughly 65% success and 80% retention. Hybrid courses have had low success rates, 52-64% in the last two years, and Online success dropped majorly to 41% last year. Students struggle significantly more in these online and hybrid courses with less face-to-face contact, while students in simply web-enhanced courses are flourishing overall.

Health Science

Overall, the Health Science department has shown Success and Retention Rates that are consistently higher than those observed for the College as a whole since the Fall 2009 semester (Course Success and Retention by Semester table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Semester table, Success and Retention 2009/10 through 2013/14 document).

Success rates for students in Health Science are consistently above 70% since the 2009-2010 academic year (notable exceptions occur in the Native American student population which has a consistently low headcount in the department, likely skewing the data for this group). For most of the groups surveyed, their Success Rate in Health Science was higher than that observed for the same group at the College overall. It is worthwhile to note that for most academic years reported, African American students had the lowest Success Rate in the department (Retention and Success by Ethnicity Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Ethnicity table, Success and Retention 2009/10 through 2013/14 document). While the Health Science department continually serves a higher proportion of female than male students, the students in this department displayed high Success Rates regardless of gender. Success Rates for all reported genders for all reported academic years remained above 70% (with the exception of students of Unreported Gender during 2009-2010 at 63%) and were higher than those reported for the College as a whole (Retention and Success by Gender Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Gender table, Success and Retention 2009/10 through 2013/14 document). Success Rates remained high for most students when disaggregated by age group; the notable exception was the "Under 18" group which reported the lowest success rates of all age groups for 3 of the 5 academic years reported (58% in 2009-2010, 70% in 2010-2011, 70% in 2011-2012; Retention and Success by Age Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Age table, Success and Retention 2009/10 through 2013/14 document). This same trend was apparent when the data was disaggregated by enrollment status, as those students in the "Currently K-12" group showed low Success Rates during these same semesters (57% in 2009-2010, 64% in 2010-2011, 63% in 2011-2012; Retention and Success by Enrollment Status Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Enrollment Status table, Success and Retention 2009/10 through 2013/14 document). Success Rates reported for day students have been consistently lower than those reported for evening students for all academic years reported (Retention and Success by Day or Evening Table, Success and Retention 2009/10 through 2013/14 Health Science Department document).

Retention rates for students in Health Science did not fall below 89% for any year reported for any ethnic group surveyed and were consistently higher than those reported for the College as a whole (Retention and Success by Ethnicity Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Ethnicity table,

Success and Retention 2009/10 through 2013/14 document). Retention Rates for all reported genders for all reported academic years did not fall below 87% and were higher than those reported for the College as a whole (Retention and Success by Gender Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Gender table, Success and Retention 2009/10 through 2013/14 document). Retention Rates remained at or above 87% for all age groups reported for all academic years reported and were consistently higher than those reported for the College as a whole (Retention and Success by Age Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Age table, Success and Retention 2009/10 through 2013/14 document). Retention Rates remained at or above 80% for all enrollment statuses reported for all academic years reported and were consistently higher than those reported for the College as a whole (Retention and Success by Enrollment Status Table, Success and Retention 2009/10 through 2013/14 Health Science Department document; Course Success and Retention by Enrollment Status table, Success and Retention 2009/10 through 2013/14 document). Retention Rates remained at or above 84% for both day and evening students for all academic years reported and were consistently higher than those reported for the College as a whole (Retention and Success by Day or Evening Table, Success and Retention 2009/10 through 2013/14 Health Science Department document).

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

8-B. Completion - Success Online

The college has a goal of improving success in online courses. Examine the "Course Success and Retention by DE vs Non DE" data table in the "Effectiveness: Success and Retention" data packet. What significant gaps do you see in success between online/hybrid and non-online courses? What changes could be made to reduce these gaps? If your program does not offer online/hybrid courses, please write "not applicable".

Response Detail

No Response Information to Display

Narrative

Biology
 Enrollment in online courses has steadily grown over the past five years: 36 - 91 - 148 - 211. In 2014/15 online courses accounted for 12% of our total enrollment; these courses include some, but not all, sections of BIOL 100 (Intro to Life Sciences) and 310 (Nutrition). Success rates of online students has been steadily increasing over the last three years (41% -55% - 63%) and this year has reached parity with our overall success rates in face-to-face (F2F) courses. We can hypothesize that this may be attributable to increased training and proficiency of our online instructors. However a disaggregated analysis is needed in order to compare success rates between online and F2F sections within the same course.
 In 2014/15 18% of our enrollment was in web-assisted courses - some sections of BIOL 110 (Principles of Biology) and all sections of BIOL 260 (Human Physiology). Our success and retention rates in web-assisted sections are consistently higher than in either face-to-face (by 6-10 percentage points) or online courses (by 8-30 percentage points). One might be tempted to conclude that these statistics demonstrate the value of including physical face-to-face interaction instructor-student and student-student interaction. However, the majority of enrollments in web-assisted courses are in BIOL 260; these are usually students in their final course of the program and therefore are the strongest performers. A more accurate comparison would be to examine web-assisted and fully face-to-face versions of this course; the latter is not offered making this comparison impossible.

Health Science

n/a - no HSCI courses are currently offered online.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

8.B. Progress & Completion Online - Observation

Observation: For online courses describe any significant differences in the success and retention of students who are taking online courses compared to face-to-face courses

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology

BIOL 310 Nutrition is the only Biology course taught completely online, although BIOL 100 will soon be offered as well. As mentioned earlier, success in purely online courses last year was very low, 41%, while retention was also lower than other courses, at 70%. More work must be done to monitor and perhaps intervene early to help students be more successful in online and hybrid courses.

Health Science

n/a - no HSCI courses are currently offered online.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

8.C. Progress & Completion - Evaluation

Evaluation: Based on these trends, what do you feel are significant factors or barriers influencing student success in your courses and program? What changes (e.g. in curriculum, pedagogy, scheduling, modality) could be implemented to improve these trends?

NOTE: If you intend to implement any of these changes, you should create Action Plans in the Planning module of SPOL. Doing so will also allow you to request resources that may be required for successful implementation.

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology

Student preparedness is a perpetual challenge in biology courses in general. The scientific terms can seem to be equivalent to learning a new language, and many of our students are already working on mastery of English. As previous data have shown, success in math is key to success on many other courses, including biology. We should continue to encourage students to take math and chemistry early and often, before diving into biology courses.

Collaboration with instructors in these related courses could produce problems and case studies that involve biological aspects. The physics of motion apply to organisms as well as to blocks on ramps. Perhaps a FIN or other organized structure could provide the basis for these collaborations on modified curriculum.

Reading and interpreting a scientific text can be a challenge. Denise Hum (Math) is leading a group of faculty, including some biology faculty, in Reading Apprenticeship training during this term and through the summer. Implementation should begin next fall in several courses.

The idea of an Anatomy Academy proposed last year will be revisited and evaluated thoroughly. Implementation may require grant funds - it's not clear yet what direction we may go. It is still debatable if and how such a program may be effective in improving success for Anatomy students.

For nonmajors, if course topics can be presented in a way that is most relevant to their current interests, then students may remain motivated to completion. This may take a major renovation of the curriculum, and require the dedication of FT faculty. The position proposal is appended.

Health Science

The most noteworthy trends in this dataset are the low Success Rates observed for Under 18/Currently K-12 students (see part a for details). This group comprises both the concurrent enrollment students who take HSCI courses at their high school campuses as part of an Early College program and Middle College students who take HSCI courses on campus. These data confirm what several instructors have observed anecdotally - that high school students enrolling in these courses are more likely to be underprepared for the demands and, as a result, not ultimately succeed in the course. Changes that have been implemented which may have contributed to the increase in this group's success in 2012-2013 and 2013-2014 include better advising/guidance by high school staff enrolling students in these courses.

As the data demonstrate, the Health Science department disproportionately enrolls female students in its classes. It is unclear why this is so and whether measures should be taken to increase the enrollment of male students.

Overall the Health Science department has higher success and retention rates than the college as a whole. This may be due, in part, to skewing from the First Aid courses which, like CPR, are effectively Pass/No Pass courses in which virtually all students learn to demonstrate the necessary skills to earn certification.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

9.A. SLO Assessment - Compliance

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Are all active courses being systematically assessed over a 3-year cycle? Describe the coordination of SLO assessment across sections and over time.

Response Detail

No Response Information to Display

Narrative

Biology

The biology program is struggling to regularly assess its SLOs (or at least to enter the results in TracDat). The department does not have a faculty coordinator, has two of its four full timers on significant levels of reassignment, and has provided little coordination and training of adjunct faculty. There are a few courses (BIOL 100, 110, and 310) that have no full timers assigned to teach them and to ensure compliance. We will create a planning objective to address this deficiency.

BIOL 103 - has not been offered in quite a few years and is being deactivated.

BIOL 130 - Three of the 5 SLOs were assessed this fall. The remaining 2 SLOs are being assessed this term. Additional feedback was obtained on usefulness of course resources that may help guide changes in teaching approaches.

?BIOL 132 - Three SLOs were assessed in Fall 2016. The remaining 2 SLOs were assessed during the 14/15 cycle. The timing of all assessments is in compliance with college policy.

BIOL 225 - of the 6 active SLOs, 5 have been assessed within the last 4 years, multiple times for some of them. One SLO will be inactivated, as it is no longer a major outcome of the course.

BIOL 230 - assessed multiple times over the last 4 semesters, including applying SLO outcomes to PLO assessment. All SLOs have been assessed at least twice, and plans are in place to assess those due for reassessment in 2017. Also, recent course instructors discussed and reevaluated the course SLOs. We came up with fewer, simplified and broadened SLOs that are awaiting approval in CurricuNet.

BIOL 240 - assessed in 2016 and 2015. The course was not taught by a FT faculty for 3 of the last 4 semesters through Spring 2016, and was not assessed (at least recorded into TracDat) by the assigned PT faculty during those 3 semesters. All SLOs have been assessed at least once (mostly twice). 2 SLOs are due/overdue for reassessment in 2017, and these assessments are planned. Also, recent course instructors discussed and reevaluated the course SLOs. We came up with fewer, simplified and broadened SLOs that are awaiting approval in CurricuNet.

BIOL 250 - assessed at least once in the last year; all SLOs assessed at least once in the last 4 years but some individual SLOs are at the end of this cycle

BIOL 260 - assessed at least once in the last year; all SLOs assessed at least once in the last 4 years

Health Science

The following HSCI courses are currently in the Cañada College catalog. The SLO assessment record for each is as follows: HSCI 100 - All 5 of the SLOs for this course have been assessed at least once in the last 4 years.

HSCI 115 - 1 of the SLOs for this course was assessed once in the last 4 years. The remaining 2 SLOs currently listed for this course have no record of ever having been assessed. This course was last run in Fall 2012, and was banked during the Fall 2016 semester. Its removal from the Cañada College catalog will be effective as of Fall 2017.

HSCI 116 - 1 of the SLOs for this course has been assessed once in the last 4 years. The remaining SLOs currently listed for this course have no record of been assessed in the current iteration of TracDat. A major limitation is that this course has been offered successfully only twice (Fall 2012, Spring 2014) since its creation in 2011.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

9.B. SLO Assessment - Impact

Summarize the dialogue that has resulted from these course SLO assessments. What specific strategies have you implemented, or plan to implement, based upon the results of your SLO assessment? Cite specific examples.

Response Detail

No Response Information to Display

Narrative

BIOL 130 Introduction to Human Biology:

BIOL 132 Human Biology Laboratory:

BIOL 225 Organismal Biology:

BIOL 230 Cell and Molecular Biology:

For the last 6 years, students are more frequently required to develop their own questions/scientific inquiries in the Cell and Molecular Biology laboratory, and to plan and execute their own experiments. Progress has been made in the last 3-4 years as students are becoming more competent at this process at a much faster rate. We are a bit surprised at how difficult it is for some students during the first two months of the course. The formal laboratory reports include a detailed reflection on the scientific process, and the entire assignment is submitted as part of their semesterly e-Portfolio. Since Fall 2013, students have weekly assignments (Pre-Laboratory writeups) writing their own hypotheses about scientific questions in the laboratory, and making predictions of outcomes. These weekly Pre-Labs and practice in developing hypotheses and thinking through predicted results have facilitated students' mindset of ownership of their own scientific investigations.

Daily in-lecture Blue Book questions were begun in Fall 2014 to help more directly engage students in the classroom, encourage active participation and collaborative learning among classmates, and to help the instructor track student learning progress on a more consistent basis throughout the semester. This also has significantly improved in-lecture class attendance. In addition to daily in-class Blue Book (Class/Lecture Journal) activities, daily Lesson Objectives and Study Guide questions are now collected weekly to more directly ensure that students are keeping up with the material. Regular diligence and daily reading and review are crucial habits for students to perform at their highest level in 200-level BIOL courses.

BIOL 240 General Microbiology:

As in BIOL 230, daily in-lecture Blue Book questions were begun in Fall 2014 to help more directly engage students in the classroom, encourage active participation and collaborative learning among classmates, and to help the instructor track student learning progress on a more consistent basis throughout the semester. This also has significantly improved in-lecture class attendance. In addition to daily in-class Blue Book (Class/Lecture Journal) activities, daily Lesson Objectives and Study Guide questions are now collected weekly to more directly ensure that students are keeping up with the material. Regular diligence and daily reading and review are crucial habits for students to perform at their highest level in 200-level BIOL courses. Also, new BIOL 240 students have shown high drop-off rates and varied student success on exams early in the semesters for the last several years. This may be at least partially due to lack of agreement in prerequisites across the SMCCC District, and the resulting lack of online prerequisite checking. Therefore, Dr. Staples has begun what will now be a regular practice (as early results look very promising in Spring 2017) of contacting all enrolled and waitlisted students for BIOL 240 two or more weeks before the semester starts, with an honest summary of what is expected of them during the semester: the very important requirements of CHEM and BIOL lab course prerequisites because of the extensive chemical principles and fast start to the course. Before the semester started, Dr. Staples also firmly expressed the necessity of coming to the first day of class with Textbooks in-hand (having read the first 2 chapters) and Lab Manuals ready to use in the laboratory on the first day. As mentioned, early indications are VERY good as students arrived very ready to meet course expectations, and initial indications from 2 semi-weekly quizzes so far and a first look at last week's first midterm exam are showing great improvements over past semesters' results. It will be very interesting to compare first midterm performance from this semester with several past semesters.

BIOL 250 Human Anatomy:

The ultimate outcome for this course is that students are able to correctly locate and identify anatomical structures. We continue to assess this through lab exams using models and specimens. Each time the assessment is done, we find that on average, the results meet our success criterion. There is a wide range of student abilities and not every student achieves this desired level of mastery. In Prof. Hirzel's courses he continues to use a game theory-designed quiz system to give students increasing levels of difficulty/challenge in preparation for the exam. Students report that they like the system but, since this wasn't a controlled experiment, he is unable to determine the quantitative impact on scores. Anecdotally, students request that lecture quizzes be constructed in a similar fashion; this suggests that at least the pedagogical change increases student engagement.

BIOL 260 Human Physiology:

One of the SLOs for BIOL 260 Human Physiology is "Research, summarize and cite articles from peer-reviewed scientific literature." This has been assessed by Dr. Behonick for several semesters. After observing that students did not get sufficient experience with the peer-reviewed scientific literature when working with this reading material in group assignments, in Spring 2014 she began assigning literature reviews as individual efforts and tracking student progress over the course of the semester (and over the course of successive assignments) based on overall scores and feedback. While there was a general trend toward skill improvement, as demonstrated in the SLO analysis as well as students' perceptions of their skills, it is clear from this analysis that additional experience reading and analyzing scientific literature is required for students in the Allied Health program.

HSCI 100 General Health Science :

One of the SLOs for HSCI 100 General Health Science is "Describe prevalent contemporary health concerns and problems, their

characteristics and methods of care including (but not limited to) nutrition, mental health conditions, chronic illnesses and infectious diseases.” This has been assessed by Dr. Behonick for multiple consecutive semesters using the Current Issue Project, in which students research a contemporary controversial health issue and present this during a class-wide poster session on the last day of lecture. This assessment has resulted in an ongoing refinement of this project and how it is scaffolded for/presented to the students in this course. This first involved creation of an explicit scaffolding process wherein students were forced to complete and submit sections of the project throughout the semester for feedback, and subsequently involved the incorporation of a library orientation/research skills lesson from the library staff into the course. Comparison of assessments of this SLO before incorporation of a more explicit scaffolding process and structured lesson on research skills (Fall 2010 semester, cohort did not achieve SLO) vs. after (Spring 2016 semester, cohort achieved SLO) suggests that these additional levels of support are beneficial to students in executing this project and achieving this SLO.

Daily in-lecture Blue Book questions were begun in Fall 2014 to help more directly engage students in the classroom, encourage active participation and collaborative learning among classmates, and to help the instructor track student learning progress on a more consistent basis throughout the semester. In addition to daily in-class Blue Book (Class/Lecture Journal) activities, daily Lesson Objectives and Study Guide questions are now collected weekly to more directly ensure that students are keeping up with the material. Regular diligence and daily reading and review are crucial habits for students to perform at their highest level in 200-level BIOL courses.

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Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

10 PLO Assessment

Describe your program's Program Learning Outcomes assessment plan. Summarize the major findings of your PLO assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Biology Majors

A new assessment method was tried in the last 2 terms. The portfolio assignment was not useful for students beyond receiving classroom credit, since it was not implemented college-wide. The new assessment was a figure and a writing prompt that required students to think broadly and specifically about biological concepts involving genetics, evolution, development, and adaptations (file: PLO2 Fish Assessment). It was designed to address PLO 2: Recognize and explain the evolutionary connections between biological structures and their function and between organisms and their environment.

Results (file: PLO2 Assessment Results 2017) indicate that students wrote an average of 4.7 explanations apiece, all of which met the rubric standard of basic or proficient. Most students recognized that environmental conditions and developmental factors could explain the example, as well as genetic inheritance. Overall, it indicated that our Biology Majors are able to synthesize concepts from different areas of biology. Success!

These results included students in BIOL 225 Biology of Organisms, required for Majors, whether they were completing their degree or not. It allows a larger sample size of students and should make the results more meaningful.

In BIOL 230 Cell and Molecular Biology, PLO assessments continue to focus on laboratory reports (Scientific Method and Data/Information Analysis) and lecture exam questions (Structure-Function Relationships). So far these have been good indicators of student success in these areas, and varied student performance on assessments continues to inform us about improving teaching and learning practices in the classrooms, and where more individual student assignments are needed to force student engagement with the most important and more difficult concepts. The most recent PLO assessment, directly addressing relationships between molecular structure and molecular function in cells, fell below criteria. This standard has been assessed with varied success over the years, and as this is one of the first concepts taught in the course, is most often assessed early in the course (first midterm exam). Plans are in place to more often assess this SLO/PLO later in the semester, when students are more adjusted to course demands, and have more experience and knowledge of this recurring concept in Biology. It will also be informative to assess this PLO early in the semester, and then again and more thoroughly later in the semester to gauge student improvement.

Allied Health and Interdisciplinary Studies Majors

PLOs have not been consistently assessed for allied health graduates (students who graduate with A.S. in Allied Health or A.A. in Interdisciplinary Studies with emphasis in Natural Science and Mathematics) since our last Program Review. Several limitations have contributed to this.

Our plan for PLO assessment of these graduates centered on the use of e-portfolios, which have failed to gain traction in the program or at Cañada as a whole. While e-portfolios were adopted by some instructors in the program and were used successfully by these instructors for several years to assess individual students in their courses, they were determined to be inefficient. In addition, in attempting to assess PLOs using these e-portfolios and the rubrics established previously by the program faculty (published in Biology 2014-2015 Program Review, file: PLO rubrics), it became clear that while these rubrics are appropriate for assessing these PLOs for Biology majors, they are not necessarily appropriate for assessing PLOs for the more health-focused students in our program. As shown by the results from Dr. Behonick's Spring 2016 BIOL 250 Human Anatomy course, in which students completed a Movement Analysis as their signature assignment as evidence of PLO 2, the established rubric is insufficient as 2 of the 3 criteria do not apply (file: PLO2 Assessment 2017 BIOL 250). Overall, it is clear that neither the e-portfolios nor the rubrics are an effective method for analyzing PLOs for allied health graduates. Future planning will include devising a more reliable method for regular assessment of PLOs for allied health graduates.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

10.A. PLO Assessment - Plan

Describe your program's Program Learning Outcomes assessment plan. Please specify whether you are using direct or indirect measurements of assessment.

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

Response Detail

No Response Information to Display

Narrative

Faculty assessed student work posted in eportfolios of graduates of Allied Health and of Interdisciplinary Studies with Emphasis in Natural Science Programs. The PLO assessment rubric is attached to the document repository (BIOL_2015_PLO_rubrics.docx) along with a summary of the results. Only the first PLO, involving application of the scientific method of inquiry, was scored. The number of student portfolios was small (2 and 5, respectively for each program). Such a small sample size makes it very difficult to confidently draw any conclusion about program effectiveness, so our conclusions are limited to evaluation of the process.

Alignment of Course SLO results with PLOs is readily done with Tracdat reports. Not as easy is interpretation of these reports. Improvements in assessment of Course SLOs might be beneficial. These reports still would include a lot of students who are not majors nearing completion of their degrees here, and the latter group is the population of most interest for program evaluation.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

10.B. PLO Assessment - Impact

Describe your program's Program Learning Outcomes assessment plan and summarize the major findings of your assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

Response Detail

No Response Information to Display

Narrative

The student portfolios provided a convenient way to conduct direct assessment of their work by multiple faculty. As was found in the Pilot Project conducted by CIETL, there was substantial variation among faculty in applying the rubric. We need to find a way to normalize our application of the rubric. In addition, students did not necessarily post their best or most appropriate work for the PLO to which it was linked. The process would work better if students regularly updated their portfolios each term with their best work and had more guidance about appropriate PLOs. Several students that assembled even a rudimentary portfolio commented that it was a useful exercise to do. One student posted outstanding work from a summer research internship. It would be nice to get permission to share these examples of portfolios with new students.

An Excel spreadsheet of the portfolio analysis is linked in the document repository.

Alignment of Course SLO results to PLOs (see associated link) implies that most of our students are doing well on achieving the PLO expectations. The report that includes PLO alignment of SLO results from all courses required for a Biological Sciences degree seems to indicate that our students need to do better in chemistry.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Biological and Health Sciences

Response Types: All Responses Types

5 Looking Ahead

11 Program Planning

Construct Planning Objectives (through the Associated Planning Objectives field below) that describe your plans for program improvement over the upcoming two-years. As you write your objectives, be sure to explain how they address any opportunities for improvement that you identified throughout this Program Review. Add Action Plans and Resource Requests for any research, training, equipment or facilities improvements that will be needed in order to achieve your objectives.

Response Detail

No Response Information to Display

Narrative

There is no Narrative Entered.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

12 Personnel Projections

Describe your recent history requesting new faculty/staff positions. List the current and near-future new or replacement faculty/staff positions that you anticipate requesting. Identify the term or year in which you anticipate submitting the staffing request. If none are anticipated, please write "not applicable". (List only; no justification needed here.)

Response Detail

No Response Information to Display

Narrative

No recent requests. We anticipate requesting for a new FT faculty either Spring 2015 or Fall 2015.

Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display