Assessment Report

Yuba Community College District

YC - Biology & Ecology Program Recommendations

Year of Review: 2013-2014

Type of Review: Self-Study (4-year review)

Executive Summary (Include a list of team members): The Biology & Ecology Program Recommendations were reviewed by the Dean of Library Services, Distributive Education and Media Services in Nov. 2013 in lieu of a dedicated MESH Dean.

The Biology & Ecology PR clearly defines academic curricula and program improvement initiatives which reflect District and College goals. There is a identified need for additional faculty, support staff (IA's), refreshed equipment, and a restored budget for instructional supplies and equipment replacement which are critical to maintaining operational labs and hands-on student experiences. No replacement budget currently exists to properly maintain and replace equipment, in some cases hampering the ability to offer certain curriculum which jeopardizes articulation agreements. Faculty recommend restoration of the replacement and repair budgets by 50%,

Biology represents a broad demographic and reaches across various majors, career technical fields, and serves students with varied levels of college readiness. Student support services are offered in collaboration with other campus departments, including the College Success Center (Tutoring Center), Open Labs available on Fridays, and the MESA program, Technology is employed to support online web forums, elearning and self-organized study groups. All support services and the use of technology are being evaluated for impact on the success and retention of students in Biology and Ecology courses.

Several additional approaches to improving student retention and success are evident including reduction in the size of lecture classes, referral to student support services and an exploration of the 'flipped' classrooms where lecture content is offered virtually and class time emphasizes activities to develop critical thinking and applied scientific analysis.

This department actively support YC ADT target goals. Biology is developing a transfer degree specific to Biology which will aid retention and transfer of Biology majors. CORs are current. This department also provided assistance to Physical Education in the development of a Kinesiology ADT degree.

Both CSLOs and PLO's have been assessed within the last year. Fifteen of the 16 SLO's have been assessed at least once, including BIO and ECOL courses resulting in changes to instructional strategies. Faculty recommend additional instructional associates and an expanded budget for student assistants to support lab preparation and breakdown in order to maintain high levels of program support at Maryville, SCC, Clearlake and Beale.

Faculty are engaged in professional development and active with the BSI Committee. Collection of empirical data to support planning is being emphasized in 2013/2014.

Program Description : A1. Do students have access to curriculum-specific and/or program-specific support services? If so, describe this service(s). If not, explain why.

Yes, students have multiple support services specific for our program and courses within it. 1) Tutoring Center – official tutors for most courses; data demonstrates that tutored students have a higher level of success. 2) Unofficial study groups meet for most courses, encouraged and supported by faculty. 3) “Bioactive Café” – various faculty hold office hours. 4) Open Labs – Anatomy and Zoology labs are open on Friday for students to access dissections and models. 5) Online support – Web forums available for some classes. 6) Faculty review sessions – multiple exam review sessions held outside of classroom hours. 7) MESA – is a highly

prized support for students.

A2. If services are available, how do they demonstrate an increase in student success?

The Tutoring Center has official data showing increased student success. Unofficial study groups, open labs, FTF and Online faculty -student interactions all receive favorable reviews from students, indicating that the study groups, open labs, FTF and Online faculty-student interactions all receive favorable reviews from students, indicating that they were helpful and increased success. Students in study groups self-select and are more motivated. MESA students demonstrate a higher transfer rate and course success rate compared to other students. Our next steps are to establish a method to collect data and verify the anecdotal evidence.

B3. How is current and previous program review data used to refine and improve program or department practices?
PR data was used to develop the proposal to split large lectures and data was again used to show that success rates were improved after the reduction in class sizes. PR data has been used to document the high enrollment and continued high demand for Biology courses. Data was used to show that enrollment was soft in a few courses, allowing a reduction in the number of course sections offered.

Data is used to support request for staffing, both faculty and classified, as well as requests for student helpers. Since the # FTEF in 2012-2013 which are adjunct or EP (approximately 6 FTEF) outnumber the contract-based FTEF (currently 4 FTEF), we feel we have good support for our request to hire another full time faculty in Biology.

BIOLOGY AND ECOLOGY PROGRAM REVIEW
FACULTY AND STUDENT DATA 2007-2013

Year	FTEF	FTES	WSCH	STU/FAC	WSCH/FTEF
2007-8	11.67	430	12902	36.86	553
2008-9	11.03	419	12565	37.96	569
2009-10	9.53	363	10883	38.05	571
2010-11	9.83	391	11740	39.8	597
2011-12	10.47	383	11482	37.47	548
2012-13	10.3	386	11584	37.49	562
5 YR AVE	102.3	388	11651	38.16	569

Industry Trends and Program Data Analysis :

C4. How do program or department goals align with the education, diversity, demographic, and workforce needs of local communities?
Firstly, our SLOs and goals align with the broader educational goals of the college community, including the goal of increasing critical thinking and scientific method awareness in our students. We have developed, tested and reported on SLOs for all our courses. Some courses have had multiple SLOs and used them to refine and modify course instruction.

We have diverse student needs, including general education for nonmajors, prerequisite prep for allied health majors or transfer readiness for university-bound students. Our students are also diverse in other ways, such as unprepared students, older reentry students, working students and students with children. Because of this diversity, Biology instruction also is diverse and inclusive, yet rigorous and supportive. We review and compare student success and transfer rates. We receive feedback about the completion rate of our students after they transition into vocational programs, for example the RN bar exam pass rate. We respond to changes in the workforce, such as declining need for Rad Tech prep and the elimination of the LVN program. We support the MESA program as it supports students that are underrepresented in Science.

C5. How is your program or department direction driven by empirical data?
Each year, with Program Review, we evaluate enrollment and success data. We compare WSCH/FTEF over the years and across the district. Each semester, we evaluate the breadth and # of courses. If we need to decrease course offerings, we first do so with courses that have low enrollment or decrease the # of sections in courses that have multiple sections. We try to preserve courses that are required by other programs. We also try to preserve some degree of breadth of offerings, even if it is just one or two courses.

We evaluate the need for classified staff, student help, equipment and supplies based on past use and performance and balance that with future trends and needs. All expenditures, such as supplies/equipment/student helper hours are evaluated by faculty and/or staff in monthly department meetings. If deemed necessary for program vitality, the expenditure is approved. Sometimes we have lively discussions about what is vital for our program and have to adequately support our request to each other!

The supply/equipment and student worker budget cuts have devastated our department, beyond what we think the District intended. This occurred partially because our budget has been officially "understated" for over a decade – requiring annual supplementation from other sources. The District cuts, combined with the understated value of our budget, resulted in a 50% cut, not a 20% cut, in supplies and student work hours. For 2 years we have looked for cost savings and have found some unique measures, such as cutting a frog in ½ so that each lab group can have 1 leg to study muscle function in Physiology (rather than two!). Anatomy students use 1 specimen per 4 students, rather than per pair of students. We no longer provide lab coats for students. We have cut costs by 10-20%, but further savings can only come if we decrease our lab sections or cut the # of experiments done (which would require a curriculum change).

Curriculum & SLO Assessment Summary :

Curriculum & SLO Assessment Summary
D6. What has your program or department done to improve completion of degrees, certificates, or transfers? What are your future plans?
Biology has developed a transfer degree specific for Biology, rather than natural science. This will help our Biology transfer students who will now have a specific degree, mirroring their interests and future goals. Biology has also conferred with Physical Education in their Kinesiology degree and is providing required courses for that degree.

We need to hire a faculty member that can help direct and improve the transition of our students to 4-year universities. This faculty member should be expert in majors Biology coursework and have a desire to work with Biology majors. This faculty could be instrumental in connecting Biology students to support services and work to develop opportunities for summer internships and research that would make our students more competitive in the future.

D7. Do you have any courses, certificates, or degrees that should be in-activated or expanded? If yes, please identify and justify your recommendations with data.
We have inactivated all courses that no longer were appropriate.

D8. Do all of your courses have current CORs? If not, what steps are you taking to ensure compliance?
Yes, our course outlines are all current.

D9. If applicable, how are teaching methodologies in your program or department assessed?
Teaching methods are regularly assessed by

1) Department meetings – We share what we have learned with each other. For example, last year we discussed the concept of a "flipped classroom" and made plans to incorporate components of this concept in a few ways.
2) Formal faculty evaluations – Adjunct and full time faculty receive feedback from our peers on a formal basis. Many times, we either learn something from the faculty that is observed or have suggestions to share with the faculty.
3) Student feedback – Student evaluation forms are obtained through the formal process, but also many faculty include student surveys in their courses.
4) Student Learning Outcomes – SLOs are very helpful in evaluating teaching methods, since the method often is critical in achieving the Outcome. For example, student projects were instituted in Anatomy and Bio 15 as a direct result of SLO assessments.

D10. If applicable, how are the results of the assessment used to support, improve, and/or expand your current teaching methodologies?
If a method is successful, such as a "flipped classroom" day or the use of audience response clickers, then it is incorporated into more of the curriculum or reported in Program Review to support purchases or staffing. If a SLO is achieved 100% of the time with one method, such as understanding Osmosis/Diffusion in a lab report, then another method is tested, such as showing your understanding on an exam. This helps the instructor know what type of learning has occurred and whether adjustments are needed.

D11. If your program or department uses a DE modality to support instruction, how are you evaluating the effectiveness of that instruction?
DE courses are evaluated by the faculty teaching them. Several faculty incorporate student surveys in their online courses, as well. We continue to look for fair ways to evaluate a DE course since they are not the "same as" the FTF version. Student success rates and overall grades are 2 ways that we evaluate the success of DE courses.

D12. If your department offers DE courses, what support services does it provide for DE students? What can be done to improve support services for these students?
Tutoring for DE courses is difficult and ways to provide tutoring should be explored. Interaction with the instruction is, similarly, difficult. We look forward to the new Learning Management System and ways within in that improve support to DE students.

D13. How is your program or department applying sound principles of learning and teaching theory to its curriculum?
Learning is easier to facilitate in Biology since most of our courses have a hands-on laboratory component. Biology incorporates multiple modalities of learning, such as visual (movies, labeling diagrams, pictures, Power Point), hearing (lecture, group discussion), feeling (touching specimens), doing (everything in lab!).

Our introductory courses (Bio 10L, Bio 15, Eco 11) have only 3 hours of lab per week, but most courses (majors Biology courses, Anatomy, Physiology, Microbiology) have 6 hours of lab per week. This makes the courses more expensive (back to the fact that our budget is severely underfunded) but also makes our student preparation far better for their future careers.

Our lecture-only courses usually have a lab component that can be taken concurrently or subsequently. The courses without a lab component have incorporated student activities that encourage interaction, critical thinking and participation, such as evaluating how much of the world resources your life-habits use up. An assignment like this takes the student away from books and exams and makes them think – who, what, how much, why?

D14. Which CSLOs (course student learning outcomes) and PLOs (Program learning outcomes) were assessed within the last year?
Both CLSOs and PLOs have been developed. 15 of the 16 CLSOs have been assessed at least once. 6 of the 16 have been assessed more than once and 1 course has been assessed 7 times voluntarily. The courses assessed in 2012-2013 were Bio 15 and 5 and Ecology 10, 11 and 12.

D15. For each of the above, how did the assessment data influence program, department and/or course improvement?

PSLOs were written and then applied. It was determined that all courses within the Biology Program incorporated Critical Thinking and/or Science Method, therefore the Biology Program also was meeting the SLOs. Progress in scientific awareness is evidenced by improvement in scored responses in Ecology 10 and Biology 15, where students are first exposed to the scientific method. Critical thinking skills continue to be carefully monitored by our SLO's in Biology 5 and Biology 6 where students reach conclusions and test hypotheses based on data they have gathered themselves.

CSLOs have been assessed on rotation since their inception. Faculty involved in each course were responsible for CSLO assessment and together reviewed the meaning and application of the assessment results. The next steps were then determined. All of this has been documented in TracDat.

Our goal has been “continuous course improvement” by the ongoing development, assessment and reporting of new CSLOS.

Goal Type
Yuba College Goals
E16. How do program or department goals align with stated Yuba College goals?

The Biology program as a whole mirrors and meets Yuba College goals.

Goal 1: Biology gathers, assesses and utilizes data to make faculty and staffing requests, program resource allocations, changes to curriculum and improvements for student success.
Goal 2: Biology considers itself part of the community and district whole in which we all thrive or none thrive. Thus our decisions are made for student success rather than for program perpetuation.
Goal 3: Changes and efficiencies are made and evaluated. Continuation of the change is based on balancing teaching/learning to cost reduction, but not costs alone .
Goal 5: The availability, sequencing and support of courses is directed at making our student’s education as efficient and successful as possible.
Goal 8: The Biology department strives to maintain high educational standards, while simultaneously responding to the needs of our diverse student body and the needs of the community, industry and transfer institutions.

YCCD Board of Trustees Vision
E17. How does the program support the YCCD District Vision Statement? Specifically, how does the program meets the needs of our students and communities?

Biology’s foremost goal is to develop and maintain programs and facilities that best meet the needs of our students and communities, as stated in the YCCD District vision statement. Our department has a history of providing a diverse educational atmosphere while simultaneously supporting student success in a trusting, supporting environment. We work hard to provide this innovative and rigorous education while using our financial resources wisely.

Equipment/Technology
Technology

F18. To what degree does your program or department have adequate and appropriate technology to support effective instruction (e.g., software, computers, and information technology)?

As cited in previous Program Reviews, we have been adequately equipped in the past to support good quality Biology instruction. However, without replacement funds for multiple years, we are seeing a larger portion of our budget go to repairs and emergency replacements. For example, Clear Lake will need new computers and BIOPAC data acquisition systems (approximately $60,000 for an entire lab) in order to continue Physiology. In addition, no changes or improvements in lab technology or teaching technology have been supported because of budget constraints. Computers, printers, networks, and presentation systems in lecture rooms and laboratories of the 800 building are only replaced if and when a catastrophic breakdown occurs. They should be replaced on a rotating basis and upgraded regularly.

Equipment

F19. To what degree does your program or department have adequate and appropriate equipment (other equipment, not computers or IT related).

The current UC Davis Body Program policy allows a single cadaver to be used for only three years. Thus, in order to maintain 2 cadavers in the classroom and 1 in dissection, a new cadaver must be purchased yearly. This means that we need a separate budget to purchase the cadavers from the biology instructional supply budget. Other pieces of equipment, such as spectrophotometers, microscopes, centrifuges are all aging (>10 years old) and there is no replacement budge or schedule for them. Expensive hardware, such as the data acquisition systems in Physiology, models in Anatomy/Zoology/Biology, autoclaves and media preparation systems in Microbiology commonly break down and have to be repaired or replaced. We have no replacement budget and our repair budget is underfunded by several thousand dollars per year. Our replacement budget needs to be increased by 50%. District support is needed for matching equipment grants.
Our supply budget was disproportionately reduced in the last 2 years and needs to be increased by 50%. Materials and supplies are mainly used in lab education and are a required part of the curriculum. Lab curriculum cannot be changed much without going through the curriculum committee and affecting articulation agreements. Therefore, we must continue to provide meaningful lab experiences, including the required purchases of plant and animal specimens, reagents and cultures, gloves and other safety. The budget constraints prevent us from updating laboratory equipment and techniques. In Biology 15 there is a need to purchase data acquisition equipment. In Biology 4 there is a need to replace skeletal parts. If we add laboratory learning at Sutter Center, then equipment for a lab would be need (microscopes, labware, computers and data acquisition,etc).

Facilities
G20. To what degree does your program or department have adequate facilities to support effective instruction? Please explain.

After the 800 building remodel, several modifications were needed and have not yet been funded, such as electrical outlets in Anatomy (currently safety hazards), shelving for microscopes (larger so the microscopes actually fit in them) and student study areas for Anatomy, Zoology and Physiology, etc. These changes might cost $5000 or more each.
Before the remodel, the restroom facilities in the 800 building were below the needed capacity and became more inadequate after the remodel (2 women's stalls for about 40 classrooms and offices). We need to add another restroom, even if it is a stand-alone facility. The lecture halls in the 800 building also lost capacity with the remodel and we have only 2 lecture rooms with capacity for more than 50 students. Therefore, larger Biology lectures have to be held in other buildings. Additionally, different classroom lecture designs will be needed to allow for more cooperative learning and "flipped classroom" arrangements.
At Sutter Center there are no labs in which we can complete and expand our course offerings. Bio 15 and 10L are introductory courses with high enrollments that we cannot offer at Sutter because there are no lab facilities. At least one lab should be built so that students have the option to complete their coursework at Sutter.

Faculty

H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No, we do not have adequate faculty. We currently are in the process of hiring a full-time faculty for Botany (and Ecology hopefully), a position that was approved 2 years ago. The hiring process was halted at that time due to budget constraints, so we have been without a full-time faculty in this vital area of our majors Biology program for over 2 years.

This year, another of our full-time faculty took a position elsewhere, leaving another vacancy. We also have a faculty member on sabbatical for 2013-2014 and a faculty member who is reducing their workload for 2014-2015. Therefore, even with the hire for this year, we will still be 1 to 1 ½ faculty members less than full staffing.

Because we only have 3 working faculty this year (instead of 6) on the Marysville campus, important activities and functions are not being covered.

Staffing
I22. Does this program have adequate technical/clerical staff to support a high quality program?

Our Program Reviews every year have documented the need for additional Instructional Assistants. Marysville campus has 1 full-time IA who has responsibility, in part or in whole, for 20 courses, some of which have 2 lab sessions each week. She is responsible for researching, purchasing, storage, maintenance, safety, and governmental regulations. She manages the student workers, trains students and faculty, and interacts with other staff. Thus we need an additional fulltime IA.

The Marysville Biology department also utilizes student workers, but the student worker budget was decreased by 50%. These students clean glassware, make solutions, set up and breakdown lab equipment (as lab rooms often have different courses in the morning vs afternoon), dissect specimens, stock shelves, make and maintain cultures and media, etc. Without the students to act as instructor-extenders or IA-extenders, then instruction or preparation for instruction will not happen. Thus we need a minimum of 30 hours/week.

The Clearlake program has never provided a budget for an Instruction Assistant and should do so for Biology and Chemistry. As the current Clearlake instructor nears retirement, it will be difficult to find a replacement instructor that is capable and willing to do the onerous amount of lab prep. Thus we need a half-time IA at Clearlake. If laboratory facilities are added to the Sutter Center, we would need a part-time IA for that facility.

Faculty and Staff Support and Professional Development
J23. In the last year, what professional development or networking has faculty and/or staff participated in?

Faculty and staff attend on-campus Flex and opening day learning experiences. Faculty also attend continuing education conferences, such as Human Anatomy and Physiology (HAPS), continuing medical education (for Physiology), field studies to further education and experience in field biology courses, etc.

J24. How did these activities contribute to student success? (include supportive data)

Attending HAPS opened opportunities to provide models and hands-on learning for Anatomy. We incorporated clinical studies in Physiology, independent experimentation rubrics and applied clinical/medical knowledge to the instruction of future nurses.

J25. How does professional development in your program or department support basic skills students and foster inclusive classroom environments that value diversity?

Our faculty have participated in the BSI committee and activities. Classroom strategies that we share in the department promote diversity and inclusiveness, such as projects that require students to work in small groups, rotating group membership in order to prevent cliques, supporting students mentoring students, incorporating volunteerism into the curriculum, etc.

J26. What Staff Development activities would you suggest be offered in the next year that would enhance your program?

Technology in the classroom, student success strategies, student-centered learning.

Future Goals and Program Direction: Future Goals and Program Direction
K27. Based on Program Review, what are your plans for future department/program improvements?

1. We are eager to see how the new AS degree in Biology blossoms and how we can encourage our students to consider pursuing it.
2. We will continue to look for ways to improve success and retention. We will use CSLOs and PSLOs, retention rates, transfer rates to assess this.
3. We will seek to improve faculty staffing, with more full-time faculty and good quality long term adjunct faculty.
4. We will seek to increase our IA and student worker support, not only in allocated hours but also in training, experience and retention.
5. We will continue to assess the learning environments and seek to provide good quality equipment, materials and supplies, technology, and support services.
6. We will maintain and upgrade curriculum and learning assessments.
7. We will strive to create an atmosphere of excellence, in academics, student success, community reputation, presentation of our facilities and professional presence.
8. We will continue to participate in and lead professional development.
9. We will continue to support and improve all Biology program offerings, whether at Marysville, Clearlake, Sutter, Beale or elsewhere.

Course Content and Statistical Analysis: TBC

Are you ready to submit your final program review?: Yes

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
The program faculty will establish an Associates degree in Biology and assess articulation agreements with other colleges and universities.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
The deparment faculty will look for ways to improve success and retention rates				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
The department will seek to maintain and/or improve staffing for the department				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
The program faculty and staff will assess the facilities to improve safety and learning environments				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
The department faculty members will seek funding to allow the department to maintain, replace, repair current equipment and to allow for the purchase of additional equipment.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
Maintain and Update Program Curriculum to ensure SLO acheivement, transfer to other higher eductional institutions or programs				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
Faculty seek to improve curriculum design and teaching methodology through professional development, peer discussion, and classroom experimentation.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YC Goal 1 - E16. How do program or department goals align with stated Yuba College goals The Biology program as a whole mirrors and meets Yuba College goals. Goal 1: Biology gathers, assesses and utilizes data to make faculty and staffing requests, program resource allocations, changes to curriculum and improvements for student success.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YC Goal 2 - Goal 2: Biology considers itself part of the community and district whole in which we all thrive or none thrive. Thus our decisions are made for student success rather than for program perpetuation.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YC Goal 3 - Goal 3: Changes and efficiencies are made and evaluated. Continuation of the change is based on balancing teaching/learning to cost reduction, but not costs alone .				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YC Goal 5 - Goal 5: The availability, sequencing and support of courses is directed at making our student's education as efficient and successful as possible.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YC Goal 8 - Goal 8: The Biology department strives to maintain high educational standards, while simultaneously responding to the needs of our diverse student body and the needs of the community, industry and transfer institutions.				

Goal	Recommendations	Plan of Action & Budgetary Impact / Tasks	Status	Feedback & Follow-Up
YCCD VS 3 - E17. How does the program support the YCCD District Vision Statement? Specifically, how does the program meets the needs of our students and communities? Biology's foremost goal is to develop and maintain programs and facilities that best meet the needs of our students and communities, as stated in the YCCD District vision statement. Our department has a history of providing a diverse educational atmosphere while simultaneously supporting student success in a trusting, supporting environment. We work hard to provide this innovative and rigorous education while using our financial resources wisely.				