INSTITUTIONAL PROGRAM REVIEW 2012 – 2013
Program Efficacy Phase: Instruction

Purpose of Institutional Program Review

Welcome to the Program Efficacy phase of the San Bernardino Valley College Program Review process. Program Review is a systematic process for evaluating programs and services annually. The major goal of the Program Review Committee is to evaluate the effectiveness of programs and to make informed decisions about budget and other campus priorities.

The Institutional Program Review Committee is authorized by the Academic Senate to develop and monitor the college Program Review process, receive unit plans, utilize assessments as needed to evaluate programs, recommend program status to the college president, identify the need for faculty and instructional equipment, and interface with other college committees to ensure institutional priorities are met.

The purpose of Program Review is to:

- Provide a full examination of how effectively programs and services are meeting departmental, divisional, and institutional goals
- Aid in short-range planning and decision-making
- Improve performance, services, and programs
- Contribute to long-range planning
- Contribute information and recommendations to other college processes, as appropriate
- Serve as the campus' conduit for decision-making by forwarding information to or requesting information from appropriate committees

Our Program Review process is two-fold. It includes an annual campus-wide needs assessment in the fall, and an in-depth review of each program every three years that we call the Program Efficacy phase. Instructional programs are evaluated the year after content review, and every three years thereafter, and other programs are placed on a three-year cycle by the appropriate Vice President.

Two or three committee members will be meeting with you to carefully review and discuss your document. You will receive detailed feedback regarding the degree to which your program is perceived to meet institutional goals. The rubric that the team will use to evaluate your program is embedded in the form. When you are writing your program evaluation, you may contact efficacy team assigned to review your department or your division representatives for feedback and input. The list of readers is being sent to you with these forms as a separate attachment.

Draft forms are due to the Committee Chair and Division Dean by Thursday, February 28, 2013, so that your review team can prepare comments for the draft review meeting (March 1 and/or March 8). Final documents are due to the Committee Chair by Friday, March 29, 2013 at midnight.

It is the writer's responsibility to be sure the Committee receives the forms on time.

In response to campus-wide feedback that program review be a more interactive process, the committee piloted a new program efficacy process in Spring 2010 that included a review team who will provide feedback and/or tour a program area during the efficacy process. Another campus concern focused on the duplication of information required for campus reports. The efficacy process will incorporate the Educational Master Plan One-Page Summary (EMP Summary) and strive to reduce duplication of information while maintaining a high quality efficacy process.

Program Efficacy
2012 – 2013

Complete this cover sheet as the first page of your report.

Program Being Evaluated

Biology

Name of Division

Science

Name of Person Preparing this Report	**Extension**
Mark Ikeda	8562

Names of Department Members Consulted

Classified Staff – AURORA CASAS JESSICA JONESON DIANA GARZA SARAH MILLER Part Time Faculty – REBECCA ALLEN LIMING BU EMMA CASTRO AMY CONILOGUE JOEY COWAN DEBRA DUTTON FREDA FOX DARLENE GAMBOA MITHRA GHAFFARI NANCY GLASS MELISSA IYENGAR BRANDON JONES KATIE JOHNSON JIMMY LEE SCOTT MONDRALA PRITI MULCHANDANI REBECCA RAMOS NANCY SAAD SOHA SOBHANIAN JACOB VASQUEZ	Full Time Faculty – ALGIE AU DAVID BASTEDO LORRIE BURNHAM GLENN DREWES MARK IKEDA JOAN MURILLO ROGER SADLER TATIANA VASQUEZ

Name of Reviewers

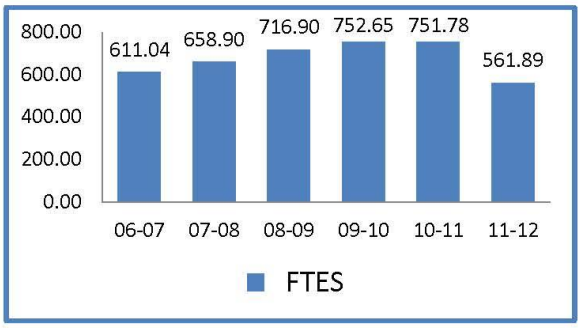
Work Flow	Due Date	Date Submitted
Date of initial meeting with department		Jan 2013
Final draft sent to the dean & committee	Feb 28, 2013	Feb 28, 2013
Report submitted to Program Review Team		
Meeting with Review Team		
Report submitted to Program Review co-chair	March 28, 2013	

Staffing

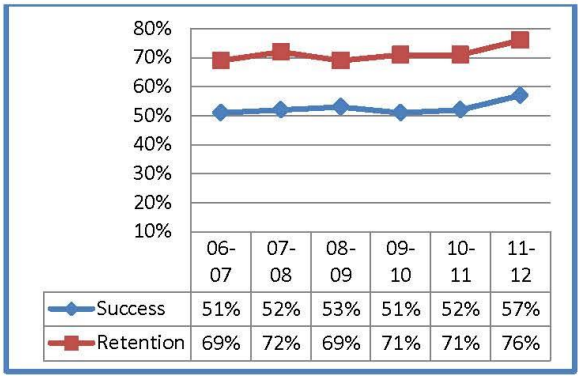
List the number of full and part-time employees in your area.

Classification	Number Full-Time	Number Part-time, Contract	Number adjunct, short-term, hourly
Managers	1		
Faculty	8		20
Classified Staff	3	1	
Total	12	1	20

Biology - 2012



	06-07	07-08	08-09	09-10	10-11	11-12
Duplicated Enrollment	3,153	3,371	3,752	3,892	3,752	2,744
FTEF	31.05	35.58	35.91	35.15	34.46	29.94
WSCH per FTEF	590	556	599	642	654	563



	06-07	07-08	08-09	09-10	10-11	11-12
Sections	130	147	149	143	135	105
% of online enrollment	1%	2%	2%	1%	2%	3%
Degrees awarded	8	2	5	1	4	4
Certificates awarded	N/A	N/A	N/A	N/A	N/A	N/A

Description:

The course offerings of the Biology Department reflect an allocation of student opportunities towards four major areas; 1) General Education science requirments, 2) Allied Health careers, 3) Biology Major transfer students, 4) Biotechnology related careers. The development of student skills as they relate to creative critical thinking, assessment of quantiative information, and deductive / inductive reasoning are the essences of each of the Department's biology courses.

Assessment

- The declines indicated in FTES are linked to section cutbacks and budget restrictions
- The above declines are linked to the decrease in course offerings and the institution of Chem prerequiste in some of our Human Anatomy & Physiology
- 10% increase in student success from '09-'10
- 7% increase in retention from '09-'10
- Decline in WSCH/FTEF due to maintaining daily/weekly distribution of course offerings while decreasing sections

Program Goals:

- Finalize and submit a transfer degree biology majors course sequence aiming for a Fall 2014 start
- Expand the implementation of Biotechnology program
- Expand the native plants gardens to nursing areas
- Develop a departmental philosophy
- Identify student skill development through Pre-Nursing and Biology Major's course sequences
- Increase interactions with Science Success Center
- Improve student success

Challenges and Opportunities:

- Maintain and build upon the increases in student success and retention
- Identify student skill development through Pre-Nursing and Biology Major's course sequences
- Plan for near term retirement(s) of full time faculty and staff
- Ensure adequacy of budget to meet the course offerrings of the Department

Action Plan:

- Develop a strategic plan for growth in the Dept consistent with departmental philosophy.
- Initiate an SI program in Biology
- Initiate a process of systematic data gathering of student entrance and exit skills from each biology course in a sequence.
- Identify ideal characteristics in hiring new, full time faculty and develop a job annoucement that reflects these characteristics
- Expand study skill workshop offerings

Part I: Questions Related to Strategic Initiative: Access

Use the demographic data provided to describe how well you are providing access to your program by answering the questions below.

Strategic Initiative	Institutional Expectations	
	Does Not Meet	**Meets**
Part I: Access		
Demographics	The program does not provide an appropriate analysis regarding identified differences in the program's population compared to that of the general population	The program provides an analysis of the demographic data and provides an interpretation in response to any identified variance. If warranted, discuss the plans or activities that are in place to recruit and retain underserved populations.
Pattern of Service	The program's pattern of service is not related to the needs of students.	The program provides evidence that the pattern of service or instruction meets student needs. If warranted, plans or activities are in place to meet a broader range of needs.

Program: Biology	Demographics Fall 2009 – Fall 2012	Campus
11.0%	**Asian**	6.2%
16.3%	**African-American**	20.3%
45.1%	**Hispanic**	48.6%
0.0%	**Native American**	1.0%
0.8%	**Pacific Islander**	0.7%
24.6%	**White**	21.0%
2.2%	**Other/Unknown**	2.1%
63.6%	**Female**	54.6%
36.4%	**Male**	45.2%
3.9%	**Disability**	5.4%
Min: 16	**Age**	Min: 15
Max: 72		Max: 88
Avg: 27.40		Avg: 29.47

Does the program population reflect the college's population? Is this an issue of concern? If not, why not? If so, what steps are you taking to address the issue?

The recent ethnicity demographic data compared with 2009 efficacy report shows that in ethnicity, **relative to the College**, there has been an increase in Asian (17%) and White (51%) ethnic group representation within the Biology program and a decrease in the representation of Hispanic (12%) and African-American (30%) ethnic groups.

These data seem to suggest trends that need to be investigated further with more fine-grained data collected within the Biology Program. Some questions that these data generate are; 1) Within the Biology Program, what is the ethnic distribution among the GE, Biology Majors, and Pre-Allied Health student populations?, 2) Within these three component parts of the Biology Program, does each component contribute equally to the change in ethnic populations observed in the Biology Program as a whole?, 3) Do these demographic shifts represent a change in the ethnic distribution among students entering a course, or among students who have successfully completed a course? It is only by the collection of these additional data that the Biology Program can formulate some targeted strategies in altering access or success rates that might underlie these changes in different ethnic populations.

Given that some of the aforementioned trends in the ethnic make-up of the Biology Program are, in part, reflective of ethnically based differentials in student success within the Biology Program some actions that are being taken to address the changing demographic characteristics within the Biology Program are; a) offerings of "Biology Study Skills Workshops" (started Fall 2012), b) increase in biology class tutoring (among GE, Biology Majors, and Pre-Allied Health areas), c) initiation of Supplemental Instruction sessions for Biology major students, d) offering, in coordination with counseling, Pre-Nursing workshops, e) increased outreach to campus clubs that may provide opportunities to contact various ethnic populations on campus. These activities aim to stimulate and sustain the interest and growth of minorities in science.

In gender representation compared to the 2009 efficacy report, the Biology Program has seen a decline in female representation and an increase in male representation **relative to the College**. These trends seem to be mirroring college wide trends but may be magnified by an increase in gender equitability among those students entering the Pre-Allied Health component of the Biology Program. This hypothesis can only be tested by more fine-grained data collected within the Biology Program.

Pattern of Service

How does the pattern of service and/or instruction provided by your department serve the needs of the community? Include, as appropriate, hours of operation/pattern of scheduling, alternate delivery methods, weekend instruction/service.

The Biology Department supports instruction to the three components of the college's mission;
Transfer (Gen Ed, and Biology Majors), **Pre-Allied Health Program** (Human Anatomy and Physiology, Micro biology), and **Career and Technical Education** (Biotechnology).
The Biology program offers morning, afternoon, and evening classes that are required for graduation with a degree and also transfer. The program offers a Saturday introductory class that fulfills a general education requirement for transfer. The program currently offers two online-hybrid sections of Human Anatomy that is required for pre-Allied Health students. The Biology Program has also offered General Biology (Bio 100) courses in the city of Big Bear through an interactive video presentation of the lecture combined with an on-site offering of labs at the local high school.

Part II: Questions Related to Strategic Initiative: Student Success

Strategic Initiative	Institutional Expectations	
	Does Not Meet	**Meets**
Part II: Student Success - Rubric		
Data demonstrating achievement of instructional or service success	Program does not provide an adequate *analysis* of the data provided with respect to relevant program data.	Program provides an analysis of the data which indicates progress on departmental goals. If applicable, supplemental data is analyzed.
Student Learning Outcomes and/or Student Achievement Outcomes	Program has not demonstrated that they have made progress on Student Learning Outcomes (SLOs) and/or Service Area Outcomes (SAOs) based on the plans of the college since their last program efficacy.	Program has demonstrated that they have made progress on Student Learning Outcomes (SLOs) and/or Service Area Outcomes (SAOs) based on the plans of the college since their last program efficacy.

Provide an analysis of the data and narrative from the program's EMP Summary and discuss what it reveals about your program. (Use data from the Charts 3 & 4 that address Success & Retention and Degrees and Certificates Awarded" on page 3 of this form.)

The EMP data in terms of measures of FTES, Enrollment, FTEF, and section counts seem to illustrate the contraction in the program offerings that has occurred recently in response to District and College wide budgetary stresses. The decline in WSCH/FTEF is attributable to an effort by the Biology Department to maintain a diversity of course offerings at times of the day, and days of the week, while decreasing the number of course sections being offered. The WSCH/FTEF ratio in lab courses (which constitute a significant proportion of biology courses) are constrained by course caps of 28 students per lab due to the safety considerations of lab courses.

The success and retention data have, in the final year of the data, shown a small increase (5%) in both success and retention. If these trends are borne out by future data, this increase might be attributable in part to the increase in the pre-requisite preparation that the GE transfer and Pre-Allied Health components of the Biology Program have undertaken recently. A new, influencing factor that may be predicted to contribute to increases in student success and retention in the near future are the efforts in Supplemental Instruction and tutoring for biology courses as a result of two STEM related grants. There has been some past evidence for the positive influence of these opportunities in success and retention mentioned in previous Efficacy Reports (see Chemistry, 2011 Efficacy report). Some additional variables that might be contributing to increases in success and retention could also include increases in STEM-related counseling availability and outreach to current students and encouragement of students to up-date or acquire an Ed Plan.

The degrees and certificates awarded by the Biology Program have been relatively stable for last three out of four reporting years. These award rates seem to be representative of a program where the majority

of the student population is not seeking a terminal Biology AS degree, but rather enrolling in courses that will contribute to their GE or Biology majors transferability or to satisfy pre-requisite courses for the Allied Health programs. Looking forward it could be predicted that the degrees and certificates awarded should see modest increases based upon the contribution of a Biology Transfer Associates Degree (for Biology major students) and the maturation of the Biotechnology certificated program.

In comparing the Biology Department's goals, established in the 2010 Educational Master Plan Report, to its achievements to date there have been accomplishments on several identified initiatives; 1) a new Biology 155 course with labs has been created and has been offered, 2) the development of a 3 semester biology majors (TMC equivalent) course sequence is nearing completion and should be entering the Curriculum process by Fall '13, 3) the Biology native vegetation planters have matured, 4) the revision of the Anatomy and Physiology lab sequence has been completed and is in use, and 5) student success and retention has increased.

A sampling of outreach activities (directed at students or faculty) that involved Biology faculty have included the following; iPads in the classroom (faculty), Caduceus Club (students), Environmental Club (students), Science and Math Day presentations (visiting students), ASCCC's Academic Academy (faculty), Research Experience Summer Programs (students and faculty).

Supplemental Data

Provide any additional information, such as job market indicators, standards in the field or licensure rates that would help the committee to better understand how your program contributes to the success of your students.

Data concerning relevant employment outlooks are found in Part IV : Planning

Student Learning Outcomes and/or Student Area Outcomes

Demonstrate that your program has continued to make progress on Course Student Learning Outcomes (SLOs) and/or Service Area Outcome (SAOs) based on the plans of the college since the program's last efficacy report. Describe how the SLOs are being used to improve student learning (e.g., faculty discussions, SLO revisions, assessments, etc.).

See Strategic Initiative 5.1

Courses	SLOs Developed (D), Current (C), Revision (R)	SLOs measured	SLO data used in teaching/program improvement	
Bio 012	C	No (Will measure F2013)	Yes it will	
Bio 090	No (Course has never been offered)			
Bio 100	C	Yes (F2012)	Yes	
Bio 104	C	Yes (F2010)	Yes	
Bio 109	C	Yes (F2012)	Yes	
Bio 109H	C	Yes (F2012)	Yes	
Bio 140	C	No (revised course will be offered for first time F 2013)	Yes	

Bio 155	R	Yes (2009)	
Bio 201	C	Yes (S2011)	Yes
Bio 202	C	Yes (S2011)	Yes
Bio 222	R	No (will assess after the revised SLOs are adopted)	
Bio 250	C	Yes (F2012)	Yes
Bio 251	C	Yes (F2012)	Yes
Bio 260	C	Yes(SP2010)	Yes
Bio 261	C	Yes (Sp2012; Sp 2013)	Yes-revision of labs because of poor SLO outcomes
Bio 270	C	Yes (F2012)	Yes
Bio 290	C	No (course not yet offered)	Yes, it will when offered
Bio 291	C	No (course not yet offered)	Yes, it will when offered
Bio 292	C	No (course not yet offered)	Yes, it will when offered

During the Fall Semester of 2012 a Division wide conversation was initiated concerning aspects of course level, and program level SLO assessment and functionality. As a result of these conversations the Biology Program decided to move towards an annual course level SLO assessment process (from the once per three year cycle) for all of its courses during the current academic year. This increase in SLO assessment frequency will provide a tighter feedback loop between assessment results and changes in teaching, and possible SLO revision.

Concomitant with the changes in the frequency of course level SLO assessments, the assignment of lead, full-time faculty to coordinate the formulation, assessment, revision, and dialog process linked with course level SLOs was also adopted. The lead full-time faculty associated with each course are the faculty that are the most frequent instructors of these respective courses and therefore are most knowledgeable in: current aspects of student populations, course content, course rigor, and in programs (or courses) that will be populated by the students completing the course.

Most of the examples of SLO assessment integration into course content has been derived from lab assessment results (through lab reports) that have illuminated an especially challenging lab concept and has resulted in the modifying the pacing of the conceptual presentation, and/or altered the experiment that is used to demonstrate the concept to students (ex in Bio 201, 261, and others). In other courses, the

addition of outside, reflective writing assignments in lecture, has been used as a didactic tool to reinforce the skill of scientific writing in lab (ex Bio 100, and others).

The dialog within the department concerning course level SLOs and their assessments has been uneven. In some areas of the Biology Program course level SLO dialog is a regular activity of the respective faculty, in other areas the dialog is informal and episodic. The development of a more robust and coherent department-wide process of internal dialog about the pedagogical aspects that underlie the SLO process is a major focus of the department.

Dialog between the department and the adjunct faculty occurs regularly in the introduction of new faculty to the course content of the courses over which they will have responsibility. After these initial meetings, a regular, coherent process of dialog with adjunct faculty about SLOs is again uneven, some areas of the biology program are performing at a level of continuous improvement and regular dialog; other areas less so. This is a second major area of focus for departmental improvement.

Describe how the SLOs are being used to improve student learning at the program level (e.g., faculty discussions, SLO revisions, assessments, etc.). If your program offers neither a degree nor a certificate, describe how the course SLOs are mapped to the core competencies.

See Strategic Initiative 5.1

The program level SLOs for Biology were developed with the intention to assess preparation of biology major's students for transfer. The initial program level assessment was performed during the Spring semester of 2012.

The Biology program level SLOs will be undergoing revision this semester due to the changing nature of the transfer requirements of Biology majors students. The TMC for Biology transfer students is currently in its final(?) review process at the State level and is anticipated to be adopted for the 2013-2014 academic year. After the adoption of the final TMC for Biology, the Biology Department will review and revise the Program level SLOs.

Part III: Questions Related to Strategic Initiative: Institutional Effectiveness

Strategic Initiative	Institutional Expectations	
	Does Not Meet	**Meets**
Part III: Institutional Effectiveness - Rubric		
Mission and Purpose	The program does not have a mission, or it does not clearly link with the institutional mission.	The program has a mission, and it links clearly with the institutional mission.
Productivity	The data does not show an acceptable level of productivity for the program, or the issue of productivity is not adequately addressed.	The data shows the program is productive at an acceptable level.
Relevance, Currency, Articulation	The program does not provide evidence that it is relevant, current, and that courses articulate with CSU/UC, if appropriate. Out of date course(s) that are not launched into Curricunet by Oct. 1 may result in an overall recommendation no higher than Conditional.	The program provides evidence that the curriculum review process is up to date. Courses are relevant and current to the mission of the program. Appropriate courses have been articulated or transfer with UC/CSU, or plans are in place to articulate appropriate courses.

Mission and Purpose:

SBVC Mission: San Bernardino Valley College provides quality education and services that support a diverse community of learners.

What is the mission statement of the program?

The Biology Program is currently developing a mission statement. Our mission statement will include our foundational college functions related to the sound academic and intellectual preparation of GE transfer, Biology Major transfer, Biotechnology certificated, and pre-Allied Health students in a stimulating and student focused environment.

How does this purpose relate to the college mission?

The diverse academic and career goals that are associated with the Biology Program's ethnically diverse student population exemplify "…a diverse community of learners." Additionally, the identification within all the Biology Program's courses of teaching and assessment characteristics that aspire to sound academic and intellectual preparation underscores SBVC's mission of a "…quality education…." Finally the Biology Program, through its involvement with Science Learning Center-related activities and others echo the admonition of "…services that support…" our students.

Productivity

Provide additional analysis and explanation of the productivity data and narrative in the EMP Summary, if needed. (Use data from charts 1 and 2 (FTEs; Enrollment; FTFE and WSCH per FTFE) on page 3 of this form). Explain any unique aspects of the program that impact productivity data for example; Federal Guidelines, Perkins, number of workstations, licenses, etc.

Note that in spite of the mandatory limits that have been placed upon numbers of students able to register for each lab course, the Biology Program's WSCH/FTEF has been steadfastly above the 525 goal established by the College as an optimum.

Relevance and Currency, Articulation of Curriculum

If applicable to your area, describe your curriculum by answering the questions that appear after the Content Review Summary from Curricunet.

Science				
Biology				
	Course	**Status**	**Last Content Review**	**Next Review Date**
	BIOL012 Introduction to Biotechnology Techniques	Active	11/28/2011	11/28/2017
	BIOL090 Preparation for Anatomy and Physiology	Active	03/08/2010	03/08/2016
	BIOL100 General Biology	Active	04/18/2011	04/18/2017
	BIOL104 Human Ecology	Active	09/14/2009	09/14/2015
	BIOL109 History of Life	Active	05/16/2011	05/16/2017
	BIOL109H History of Life - Honors	Active	05/16/2011	05/16/2017
	BIOL123 Ecology and Environment	Active	11/15/2004	11/15/2010
	BIOL140 Biology of Sexually Transmitted Diseases	Active	04/18/2011	04/18/2017

	BIOL155 Introductory Anatomy and Physiology	Active	10/26/2009	10/26/2015
	BIOL201 Cell and Molecular Biology	Active	01/26/2009	01/26/2015
	BIOL202 Organismal Biology and Ecology	Active	05/14/2007	05/14/2013
	BIOL222 Independent Study in Biology	Active	05/14/2007	05/14/2013
	BIOL250 Human Anatomy and Physiology I	Active	11/28/2011	11/28/2017
	BIOL251 Human Anatomy and Physiology II	Active	12/05/2011	12/05/2017
	BIOL260 Human Anatomy	Active	10/08/2007	10/08/2013
	BIOL261 Human Physiology	Active	11/23/2009	11/23/2015
	BIOL270 Microbiology	Active	10/17/2011	10/17/2017
	BIOL290 Biotechnology I	Active	10/17/2011	10/17/2017
	BIOL291 Biotechnology II	Active	11/10/2008	11/10/2014
	BIOL292 Cell Culture Techniques	Active	12/05/2011	12/05/2017
	BIOL123 Ecology and Environment	Pending	11/15/2004	11/15/2010
	BIOL260 Human Anatomy	Pending	10/08/2007	10/08/2013

The Content Review Summary from Curricunet indicates the program's current curriculum status. If curriculum is out of date, explain the circumstances and plans to remedy the discrepancy.

All courses offered are up to date in terms of their content review status with the exceptions of Biology 123 and 204. Biology 123 was a tele-course that has not been offered recently, and will likely be deleted and the course content be used to develop a modern version. Biology 204 has been deleted from the catalog since the course was no longer part of the articulation agreement with CSU and UC, and the course does not appear in the draft

TMC for Biology.

Biology 201 and 202 will likely be deactivated beginning in the Fall of 2014, as they are replaced by a three semester biology majors sequence that will be Valley College's biology TMC equivalent courses, and also part of the planned AS-T degree for Biology.

Articulation and Transfer

List Courses above 100 where articulation or transfer is **not** occurring	With CSU	With UC

Describe your plans to make these course(s) qualify for articulation or transfer. Describe any exceptions to courses above 100.

See table below.

Course	CSU	UC
BIOL 100	Transfer	Transfer (limited)
BIOL 104	Transfer	Transfer
BIOL 109	Transfer	Transfer
BIOL 109H	Transfer	Transfer
BIOL 140	Transfer	Transfer
BIOL 155	Transfer	
BIOL 201	Transfer	Transfer
BIOL 202	Transfer	Transfer
BIOL 222	Transfer	Transfer (limited)
BIOL 250	Transfer	Transfer (limited)

BIOL 251	Transfer	Transfer (limited)	
BIOL 260	Transfer	Transfer (limited)	
BIOL 261	Transfer	Transfer (limited)	
BIOL 270	Transfer	Transfer	
BIOL 290	Transfer	Transfer	
BIOL 291	Transfer (elective)		
BIOL 292	Transfer (elective)		

Currency

Follow the link below and review the last college catalog data.
http://www.valleycollege.edu/academic-career-programs/college-catalog.aspx

Is the information given accurate? Which courses are no longer being offered? (Include Course # and Title of the Course). If the information is inaccurate and/or there are listed courses not offered, how does the program plan to remedy the discrepancy?

The aforementioned information is accurate, with the exception of the Biol 123 and 204 courses that were mentioned in earlier in the Content Review portion of this report. These will be deleted in subsequent catalogs.

Part IV: Planning

Strategic Initiative	**Institutional Expectations**	
	Does Not Meet	**Meets**
Part IV: Planning - Rubric		
Trends	The program does not identify major trends, or the plans are not supported by the data and information provided.	The program identifies and describes major trends in the field. Program addresses how trends will affect enrollment and planning. Provide data or research from the field for support.
Accomplishments	The program does not incorporate accomplishments and strengths into planning.	The program incorporates substantial accomplishments and strengths into planning.
Challenges	The program does not incorporate weaknesses and challenges into planning.	The program incorporates weaknesses and challenges into planning.

What are the trends, in the field or discipline, impacting your student enrollment/service utilization? How will these trends impact program planning?

There are several trends at the national, state, regional, and local level that will impact the Biology Program planning in the near future. At the national level within the Biological Sciences field the acceleration of the use of genomic information continues to find new applications in all areas of biology from cellular processes to ecological studies. The logical programmatic reactions should encompass incorporation of introductory concepts of genomics into all biology courses at the level appropriate to the course. The impacts of the Patient Protection and Affordable Health Care Act (2010) on the future hiring of health care workers is as yet unknown; there is a likely effect upon the Biology Program's number pre-allied health courses (positively or negatively). Finally the educational reforms advanced by the national accrediting bodies on matters related to SLOs can be predicted to have increasing impacts upon the Biology Program's processes related to SLO documentation and

dialoguing.

At the State level several economic and educational changes will impact the offerings of the Biology Program. The economic up-turn seems to be changing from weak to moderate growth, and the concomitant leveling off and increases in budget allocations can be anticipated. The State educational initiatives, particularly results from the Student Success Task Force and TMC, have already provoked Biology Program reactions. For example, responses to SSTF include the application of appropriate course pre-requisites and the dramatic increase in student support services involvement (e.g. Biology Study Skills Workshops, Supplemental Instruction, Success Center tutorial offerings). The mandate for education plans for all students might be anticipated to provoke the use of faculty advising that would involve interested biology faculty. The development of a new three-semester biology majors course sequence has occurred in step with the development of the Biology TMC (as mentioned previously).

At the regional level the recent establishment of the UCR School of Medicine would have particular long-term consequences to the Biology Program in terms of potentially increasing the number of biology major's students and opening academic relationships and opportunities between the Biology Program and the UCR School of Medicine. Data from the State Employment Development Department suggests the following outlook (2010 to 2020) in some selected biology related careers (see table below).

Occupational Title	Annual Average Employment 2010	Annual Average Employment 2020	Employment Change Numerical	Employment Change Percent
Pharmacists	2,320	2,860	540	23.3
Registered Nurses	22,160	27,100	4,940	22.3
Veterinarians	450	600	150	33.3
Life Scientists	1,980	2,530	550	27.8
Microbiologists	100	130	30	30.0
Zoologists and Wildlife Biologists	140	160	20	14.3
Biological Technicians	360	410	50	13.9
Medical Scientists, Except Epidemiologists	880	1,210	330	37.5

Data as of 9/10/2012

Finally at the local level the maturation and institutionalization of the tutorial and Supplemental Instruction components of the Success Center will foster an increasing number of opportunities for students of the Biology Program, but will also require increasing levels of involvement in mentoring these students by Biology Program faculty.

Accomplishments and Strengths

Referencing the narratives in the EMP Summary, provide any additional data or new information regarding the accomplishments of the program, if applicable. In what way does your planning address accomplishments and strengths in the program?

The strengths of the Biology Program observable from the EMP report are the; a) increases in student success and retention, b) increasing interactions with Success Center activities, c) development of the new biology major's course sequence, c) initiation and growth of the biotechnology program, and d) biology planters initiatives (see also Part V Campus Climate).

In terms of increases in success and retention, it is hypothesized that these increases are likely due to the implementation of course pre-requisites in the General Biology and Human Anatomy and Physiology courses. The more recent increases (during the last 3 semesters) of interactions with the Success Center (in the form of tutoring and Supplemental Instruction (SI) sessions) would be predicted to also impact student success and retention. The synergies between the effects of both of these actions would be predicted to become apparent during the interim prior to the Program Efficacy report in 2016. A second prediction might be that the formal modeling of tutorial and SI activities (through structured grant-supported activities) may serve to engage non-participant students into developing informal processes that mimic these formal activities. If so, it will be important for faculty to provide the sensitive and supportive social venues that facilitate this change in academic culture.

The new biology major's course sequence has been designed to retain key pedagogical and conceptual elements that have been the foundation of the biology major's program since 1991. Biology, however, has undergone a dramatic integrative change during the interim that supersedes the ability of the current two-semester course sequence to be reflective of this disciplinary change. The new biology major's course sequence has been designed to fuse together these two elements while also satisfying the TMC requirements.

The establishment and growth of the Biotechnology certificated program has most recently exemplified the entrepreneurial spirit of academic pursuits in the Biology Program. While the program is still in its infancy and finding an identifiable audience, the growth of the program is being carefully managed and, depending on the future changes in the local occupational climate, the skills provided by this program could become highly valued due to the pervasive use of data derived from these techniques.

The matured plants in the Biology gardens will be of use to expand into the Nursing areas. Currently, planning and design of these garden areas is taking place in order to meet course-related goals and community-awareness.

Challenges

Referencing the narratives in the EMP Summary and/or your data, provide any additional data or new information regarding planning for the program. In what way does your planning address trends and weaknesses in the program?

The weakness highlighted by the EMP document and in other parts of this report fall into three categories; 1) SLO process development, 2) course level research, and 3) Biology Program Mission statement.

Given the systemic incorporation of SLO related activities into the fabric of the College, the related Biology Program processes must mature into a regular, robust set of practices that will, in a more uniform fashion, inform the internal pedagogical dialog among the biology faculty. Although (as stated previously in this document) elements of these conversations are occurring among some parts of the Biology

Program, these dialogs have not yet emerged in a coherent state at the department level.

Given the pervasive reliance upon relevant and contemporary program data, and the severely constrained ability of College entities to supply such data, it is incumbent upon the Biology Program to develop its own mechanisms for data collection to inform conversations concerning planning, development, and changes. The Biology Program has begun to initiate such data collection processes in some targeted courses and looks forward to discussing the patterns that emerge, and appropriately responding to the need for any changes indicated.

The Biology Program currently lacks a mission statement, but more importantly and relatedly, lacks a Program philosophy statement. The myopathy that develops from the institutional fascination with measureable outcomes can only be placed into perspective by an articulate program philosophy statement that represents the orientation and aspirations of the Biology Program in its relationship to the scientific endeavor and its effective communication to the public. The mission statement should serve as a simple, public-relational statement to this underlying Program philosophy.

V: Questions Related to Strategic Initiative: Technology, Campus Climate and Partnerships

Strategic Initiative	**Institutional Expectations**	
	Does Not Meet	**Meets**
Part V: Technology, Partnerships & Campus Climate		
	Program does not demonstrate that it incorporates the strategic initiatives of Technology, Partnerships, or Campus Climate. Program does not have plans to implement the strategic initiatives of Technology, Partnerships, or Campus Climate	Program demonstrates that it incorporates the strategic initiatives of Technology, Partnerships and/or Campus Climate. Program has plans to further implement the strategic initiatives of Technology, Partnerships and/or Campus Climate.

Describe how your program has addressed the strategic initiatives of technology, campus climate and/or partnerships that apply to your program. What plans does your program have to further implement any of these initiatives?

The Biology Program has continued to maintain and develop initiatives related to technology through the careful incorporation of pedagogically relevant equipment and techniques associated with contemporary Biological Sciences. Some examples are illustrated by the following;

- GPS units in field research associated with the Organismal Biology and Ecology (Bio 202) course.
- Statistical analysis software for use in the Cellular and Molecular Biology (Bio 201) course.
- iPad Human Anatomical apps used in the Human Anatomy (Bio 260) course.
- BioPac™ human physiological data acquisition and analytical hardware and software for the Human Anatomy and Physiology related courses
- PCR and gel electrophoresis hardware in use for the Biotechnology and Cellular and Molecular Biology courses.
- Digital Microscopy in Anatomy and Physiology laboratories (Bio 261, Bio 250, Bio 155)

The high cost of the initial acquisition, on-going maintenance, and supplies of such technology must always be weighed against the technology's pedagogical value in order to ensure prudent expenditure of our Program's very limited funding.

The Biology Program's most visible contribution to Campus Climate has been through the establishment and growth of our landscape planter initiative. This initiative is currently in its fourth year, and involves the use of drought tolerant vegetation in the courtyard planters associated with the HLS Building. Beyond its esthetic appeal, the selected plantings have included specimens that illustrate different botanical and ecological principles for use in a variety of biology courses. *This marriage of course learning outcomes in association with a carefully planned "educational landscape" is an idea that has been largely ignored by the College, and one that could be adopted by other programs.* The Biology Program has recently received permission to expand planting to other HLS courtyard planters.

Much of the Biology Program's vitality and currency are maintained through a diverse set of formal and informal partnerships with entities outside of the College. Currently these partnerships include;

- The promotion and targeting of NSF and Dept of Agriculture sponsored student summer research experiences (REU programs) to our biology students.
- Recent association with the Rocky Mountain Biological Laboratory (RMBL) in promoting summer research opportunities for students and adjunct biology faculty.
- Continued participation with the MentorNet™ program of professional mentoring services to recent baccalaureate, master's, and doctoral graduates.

VI: Previous "Does Not Meets" Categories

Reference your most recent Program Efficacy document, and list below those areas which previously received "Does Not Meet." Then, either describe below how your program has remedied these deficiencies, or, if these areas have been addressed elsewhere in this current document, provide the section where these discussions can be located.

N/A