Barstow Community College

Program Review

Instructional

PROGRAM:		Natural Science and Mathematics		
ACADEMIC YEAR:		2011-2012		
		By		
	Faculty Lead	Robert Stinson		
	Members	Scott Bulkley	Philip Nelson	Sally van den Berg
		Sona Vartanian	Bret Sage	

1. Program Mission and Vision

A.	Program **Mission**
	Natural Science and Math examines the physical universe, its life forms, and its natural phenomena. The program helps the student develop an appreciation and understanding of the scientific method and helps the student apply logical, quantitative, and qualitative reasoning in solving problems and analyzing arguments in both the natural sciences and mathematics.
B.	Program **Vision**
	Natural Science and Math's vision is to achieve and maintain excellence in student learning and success.
C.	Describe how your mission and vision align with and contribute to the College's Mission and Vision.
	All of the departments within the Natural Science/Math degree program contribute to the Mission and Vision of the college in a number of ways: A. "Fostering an innovative learning environment that respects the diversity of individual backgrounds, abilities, and cultures." All of the departments offer an extensive course curriculum, each of which is unique in its treatment of diverse topics. In the natural sciences, a majority of courses have a laboratory component which gives the instructor a unique opportunity to really get to know and work with their students on a one-to-one basis. The laboratory environment promotes teamwork, student-student, and student-instructor interactions. With a variety of learning methodologies and teaching strategies, it is possible for students to choose a learning style that most closely matches theirs. In some courses, a "Learning Styles Inventory," is administered at the beginning of each semester. This helps students understand what their learning style is and what it means to them in different classroom situations. Many of our students have difficulty with their initial math and science courses; and Barstow Community College has a viable and productive tutoring center for students in need of additional help beyond the classroom. B. "Offering programs to prepare student in basic skills, career and technical education, lifelong learning opportunities, and comprehensive lower division courses that meet articulation agreements for student transfer to four-year colleges and universities." The following courses meet the associate degree requirements for CSU transfer and for IGETC

requirements (BIOL 11 and MATH 1 are not on the IGETC list of classes).

Physical Science: ASTR 1, ASTR 1L, CHEM 1, CHEM 2A, CHEM 2B, GEOL 1, GEOL 1L, GEOL 2, GEOL 3, GEOL 5, OCEA 1, PHSC 1, and PHSC 2

Life Science: BIOL 1, BIOL 2, BIOL 4, BIOL 5, BIOL 8, BIOL 10, BIOL 10L, and BIOL 11

Mathematics: MATH 1, MATH 2, MATH 3, MATH 4A, MATH 4B, MATH 4C, and MATH 5

These courses have been designed and articulate for Natural Science/Math majors transferring to four-year colleges and universities. The goals of all these courses are to provide the necessary background and tools for students to achieve the institutional or general education goals of Barstow Community College. The over-arching institutional goals for BCC are: communication, critical thinking, professional development, and global awareness. All of us in the natural sciences and mathematics areas strive to prepare our students for upper division work at their transfer institution.

The contributing departments of the Natural Science/Math degree contribute to the Barstow Community College Educational Master Plan (2011) in the following ways:

A. To anticipate courses, programs, and services of the College.

There are two courses that are in preparation that add a needed emphasis on the curriculum as a whole. Biochemistry and Astronomy 2 are being developed to meet student need and demand. Allied Health requirements are fluid at best and the departments are responding to those changing requirements.

B. To project the delivery of a balanced curriculum, providing transfer, career/technical, and basic skill education.

See the answer to A above.

C. To provide analysis of current program of instruction

See the answer to A above. it is also mandated that each department review its curriculum and pre-requisites on a minimum 6 year plan. The Biology Department is set to review its pre-requisites during the Spring and Fall 2013 semesters.

2. Program Description and Overview

Assume the reader does not know anything about the program. **Describe** the program, including—but not limited to—the following:

- Organization, including staffing and structure
- Who you serve (including demographics and other data)
- The kinds of services your program provide
- How you provide them (*Including alternative modes and schedules of delivery; for example, online, hybrid, early morning, evening classes.)*

The Natural Science/Math Program includes the natural and physical sciences was well as mathematics. There are two full-time Biology instructors, one full-time Chemistry instructor, one full-time Earth Science and Astronomy instructor, and two full-time mathematics instructors. There are approximately 12 adjunct instructors, most of which are in math. The program provides the basic requirements for allied health programs, especially nursing; it also provides for transfer courses to complete a bachelor's degree at four-year colleges and universities. The program also provides classes for those who are interested in continuing their education but may not be pursuing a degree.

Natural Science and Mathematics provides both day and night classes in all the disciplines. In the sciences most of the classes are traditional format with a few online deliveries (i.e. Astronomy, Intro. to Biology, and Environmental Biology). There are hybrid math classes as well as online and traditional. Early morning classes are available in the natural sciences and in math.

3. External Factors

What external factors have a significant impact on the program? Include the following, as applicable:

- Budgetary constraints or opportunities
- Competition from other institutions
- Requirements of four-year institutions
- Requirements imposed by regulations, policies, standards, and other mandates
- Job Market
  - Requirements of prospective employers
  - Developments in the field (both current and future)

Budgetary Constraints: The full-time math instructor who left has not been replaced. This program review will address that later in the Budget Allocation Proposals. Departmental budgets have been reduced and this places a burden on science especially since they have classes that use consummables and must be replaced yearly.

Requirements from four-year institutions: Notification of any articulation changes usually comes from the counselors; for example, the changes in math requirements for science and changes in the structure of general chemistry.

Requirements from two-year allied health programs: The two-year programs have added requirements and changed existing requirement. The changes in requirements have the greatest effect on our students. Chemistry now must be a "General, Biochemistry, and Organic" general class and it must be stated so in the course title.

4. Curriculum

A.	Total number of courses in program (*break down by discipline if appropriate and helpful)*	
1.	ASTR: ASTR 1, ASTR 1L	
2.	BIOL: BIOL 1, BIOL 2, BIOL 4, BIOL 5, BIOL 8, BIOL 10, BIOL 10L, BIOL 11	
3.	CHEM: CHEM 1, CHEM 2A, CHEM 2B	
4.	GEOL: GEOL 1, GEOL 1L, GEOL 2, GEOL 3, GEOL 4, GEOL 5	
5.	MATH: MATH 1, MATH 2, MATH 3, MATH 4A, MATH 4B, MATH 5, MATH 50, MATH 55, MATH 101	
6.	GEOG: GEOG 50, GEOG 51, GEOG 52, GEOG 53	
7	OCEA: OCEA 1	
8	PHSC: PHSC 1	
B.	Percentage or number of courses with Course Outline of Record in full compliance with curriculum standards (see Curriculum Manual for additional information, if necessary)	
	Natural Science	Due to the new Chancellor's Office requirement for Methods of Instruction, most of our courses are not in full compliance. We have added the SLOs to each COR and will also be doing a prerequisite review next year. The new Methods of Instruction have been completed for Bio 2, Bio 4, Bio 5, and Bio 8 which have been submitted to the Curriculum Committee for review. Chemistry and Earth Sciences have yet to complete the Methods of Instruction.
	Mathematics	Due to the new Chancellor's Office requirement for Methods of Instruction, none of the math courses are in full compliance.
		If not in compliance, what is the plan for moving them into complilance?

		All courses should be in full compliance by the Fall 2013 semester.
C.	Plan for developing any new or additional courses and the rationale for them.	
	The Biology Department and Chemistry Department are in early development of an online Biochemistry course (no lab). Many of the two year nursing programs are adding Biochemistry as a prerequisite for entrance into their program; the four year colleges and universities have already implemented this requirement. The Chemistry Department is also looking at changes in CHEM 1 to make it a course that covers general chemistry with organic chemistry and biochemistry. Nursing programs are now requiring a course that has all three of those disciplines. We have had students who have had to retake chemistry because our CHEM 1 does not cover the extra topics. Physical Sciences are working on developing an ASTR 2 class which would cover the planets.	
D.	Plan for archiving or deleting any existing courses and the rationale for it.	
	This past Spring semester (2012) Biology and Chemistry archived or deleted a number of courses that had not been taught in many years. There is no plan to teach them again in the future. All of the physics courses were archived this past semester since we have no physics instructor and they have not been taught in at least 7 years.	
E.	Plan for additional courses for online delivery and the rationale for them. The Biochemistry course mentioned above would be an online course; it would be a 3-hour lecture course with no lab. This course will be designed for the allied health student who needs a basic introduction to the field of biochemistry. It would be cross listed in both biology and chemistry.	
F.	Percentage of the number of courses that have: 1. Prerequisites: Biology (4), Chemistry (3), Mathematics (10) Astronomy (1), Geology (0), Geography (0), Physical Science (0) 2. Co-requisites: Biology (0), Chemistry (0), Mathematics (0), Astronomy (0), Geology (0), Geography (0), Physical Science (0) 3. Advisory: Not applicable	

5. Program Status

A.	What is going well and why?
	All of our classes traditionally make and many close during registration. Enrollment is up in Natural Science and Math. The major strength of each of the departments within the program lies in the diversity of the courses offered. There are courses in all of the fields of geology, astronomy, and oceanography. In addition, there is a general introductory course in Earth Science which gives non-majors a very broad introduction to all of the earth science subjects. In Biology, Concepts in Biology serves the same purpose as a general

	introduction to the many areas of the biological sciences. Online courses and night classes are offered in each of the contributing departments. There is currently no major weaknesses with respect to curriculum in any of the departments within the Natural Science/Mathematics program.
B.	What is not going well and why?
	In Biology both instructors have overload assignments each semester and it is difficult to develop and plan for future projects when there is no time to do it. Also, the DCP and DE Coordinator come from the Biology department. There is only one chemistry instructor; there was an adjunct a few years ago. The chemistry instructor also teaches in the mathematics area. We also have only one geology instructor and it is difficult to plan with one instructor departments. In mathematics, the last full-time instructor who left was not replaced and enrollment has increased overall in all of the departments. However, we do realize that with the economic conditions in the state of California, there is probably not going to be any change in staffing.

6. Program Data

A. Performance Data

Discuss the program's performance on the specific data items listed below. *(If you have already discussed your program's performance on one or more of these components, then refer to that response here, rather than repeating it.)*

1. Course Completion Rate

	Fall 2011	Spring 2012
Astr 1	73.0	71.5
Geol 1	64.0	91.0
Bio 1	82.0	NA
Bio 2	76.3	88.0
Bio 4	79.0	94.0
Bio 5	74.0	81.0
Bio 8	NA	89.0
Bio 10	74.0	NA
Bio10L	57.0	NA
Bio 10 DE	76.0	NA
Chem 1	41.5	45.5
Math 50	76.3	67.0
Math 55	64.3	75.8
Math 101	66.0	81.0
Math 1	NA	89.0
Math 2	48.0	35.0
Math 3	91.0	90.3
Math 4A	NA	NA
Math 4B	NA	83.0
Math 4C	83.0	NA

Math 5	NA	NA
Phys. Sci.	71.0	70.0

2. Course Success and Retention

	Fall 2011 Retention	Fall 2011 Success	Spring 2012 Retention	Spring 2012 Success
Biology	93.0	95.2	94.0	91.7
Chemistry	69.0	75.0	60.5	67.0
Phys. Sciences	85.0	95.5	85.0	95.0
Math	88.0	80.4	87.0	89.8

3. Full Time/Part Time Faculty Ratio

	Fall 2011	Spring 2012
Biology	2:1	2:2
Chemistry	1:0	1:0
Phys. Sciences	1:1	1:2
Math	2:6	2:11

4. WSCH/FTEF ratio

	Fall 2011	Spring 2012
Astr 1	113/3.75	81/5.40
Geol 1	126/4.20	90/3.00
Biol 2	195/4.33	177/5.90
Biol 4	297/9.90	297/9.90
Biol 5	161/5.37	175/5.83
Biol 8	NA	225/7.50
Biol 10	84.10/2.80	NA
Biol 10L	58/1.93	NA
Biol 10 DE	135/4.50	NA
Chemistry	87/2.90	88/2.60
Math 101	129/4.30	78/2.60
Math 50	157/5.24	142/4.74
Math 55	129/4.29	153/5.10
Math 2	104/3.47	60/2.00
Math 3	147/4.90	111/3.70
Math 4A	45/1.50	NA
Math 4B	NA	25/0.83
Math 4C	25/0.83	NA
Phys. Sci.	75/2.50	69/2.30

5. Fill rate

	Fall 2011	Spring 2012
Astr 1	84.3	74.1
Biol1	102.0	110.0

	Bio 10	50.0	100.0	
	Bio 10L	103.0	NA	
	Bio 10 DE	94.0	NA	
	Biol 2	69.8	102.0	
	Biol 4	78.1	103.0	
	Biol 5	81.3	84.4	
	Biol 8	NA	78.1	
	Chem 1	65.6	64.1	
	Geol 1	81.3	NA	
	Geol 4	NA	96.9	
	Math 101	85.8	65.3	
	Math 50	100.0	78.8	
	Math 55	97.5	85.8	
	Math 2	78.0	58.0	
	Math 3	128.0	90.2	
	Math 4A	27.5	NA	
	Math 4B	NA	25.0	
	Math 4C	300.0	NA	
	Phy. Sci.	84.4	90.6	

B. Progress Program Level Outcomes (PLOs) and Student Learning Outcomes (SLOs)

1.	Summarize the progress your program has made on program and/or course level SLO measures you have applied since your last program review.
	The Natural Science/Mathematics program has completed two cycles of the assessment process for Program Level Outcomes (PLO). All course level SLOs are assessed each semester for each class and a core group are analyzed by the Class Climate assessment each semester. That data is aggregated and program norms are being established.
2.	Describe any program/course and/or instructional improvements made by your program as a result of outcomes assessment process.
	The major change is a commitment to encourage the students to use the tutoring center and other student aids provided by the publisher to increase success in math and science. Many courses have additional website information for the student (i.e. Biol 2, Biol 4, Biol 5, Geol 1, Chem 1, and most all mathematics classes.
3.	What is your plan for completing and then continuing the assessment cycle?
	We have already completed two cycles of assessment. The plan is to continue and gather baseline type data. Significant changes were made in the assessment process after the first cycle. The data from the second cycle is being analyzed, but no significant changes are going to be made for this current cycle other than those mentioned in #2.

C. Supporting Assessment Data

1.	Provide a list of any quantitative or qualitative measures not provided in 6.A. that you have chosen to gauge your program's effectiveness *(e.g.: transfers, degrees, certificates, satisfaction, student contacts, student headcount, Perkin's data, etc.)*
	One type of data to be added is the number of degrees in the Natural Sciences/Math program. We also did the Program Level Outcomes for Natural Science/Math.
2.	Summarize the results of these measures.
	We had 26 degrees awarded in 2009, 39 in 2010, 34 in 2011, and so far in 2012 we have 22 and that, of course does not include the last semester counted in 2012. We utilize a standard rubric for our PLOs that include 4 areas of concentration: conceptual understanding, strategies and processes, communication, and accuracy. These are in alignment with the mission and strategic plan. The overall results are based on 4 basic classes in the program (Bio 5, Chem 1, Geol 1, and Math 55). The scores were: CU (76%), PS (70%), C (70%) and A (74%).
3.	What did you learn from your evaluation of these measures, and what improvements have you implemented or do you plan to implement, as a result of your analysis of these measures? *(List only resources required for planned implementation in #9: Resources.)*
	Providing students with the tools to be successful is the major outcome for degrees and certificates. In the PLO program analysis we also checked a number of other factors: 80% of the students did read the text and reviewed lecture notes/slides regularly; 70% studied in a study group; only 50% attended any tutoring sessions; most got help from a classmate or friend (78%); and the factor that contributed to most problems was work (72%). The instructors are encouraging the use of faculty office hours, the tutoring center, and the use of study groups. Time management skills looks to be a major factor in the successful student.
4.	Include DCP Program Assessment Benchmarks , providing analysis of data on long term goals and objectives.
	Benchmark II relates both SLO and PLO data collection. All courses were analyzed for SLOs for the four major fields of study in Natural Science/Mathematics. There is no standard rubric used at the course level and each instructor assesses the SLOs independently of each other. For the PLOs, however, there is a standard rubric that assesses Conceptual Understanding, Processes and Strategies, Communication, and Accuracy. Biol 5, Geol 1, Chem 1, and Math 55 are used for analysis in the PLOs; these are courses that students most often take in the degree program. Approximately 175 students were assessed each semester and only Math 55 and Chem 1 had multiple sections. Data was collected by the 6 full-time faculty and 2 part-time faculty for SLOs and only the full-time faculty for PLOs (only full-time faculty taught the assessed

classes).

		Fall 2011	
	PLO #1	**PLO #2**	**PLO #3**
Biol 5	84	77	84
Chem 1	ND	ND	ND
Geol 1	68	68	86
Math 55	67	62	57

ND=not determined

		Spring 2012	
	PLO #1	**PLO #2**	**PLO #3**
Biol 5	82	67	79
Chem 1	ND	ND	76
Geol 1	Not taught	Not taught	Not taught
Math 55	88	73	84

All of the course level SLOs and the degree level PLOs tie directly to the four Core Competencies of the college: Communication, Critical Thinking, Personal Development, and Global Awareness.

D. Two-Year Scheduling Plan

1)	What is the Two-Year Plan? If no Two-Year Plan, why not?
	In Biology we have only two courses that are not taught every semester; one is offered in the Fall and the other in the Spring.
	In Chemistry the CHEM 1 course is taught in the Fall and Spring every year.
	The two year plans are filed in the Instruction Office. All departments filed a two-year plan in 2006-2007. Earth Sciences and Mathematics have offered courses in compliance with their two-year plan (no changes have been made in the plan).

7. Prior Goals/Objectives

Briefly summarize the progress your program has made in meeting the goals and objectives identified in the most recent Program Review.

Our most recent Program Review for the Natural Science/Mathematics degree is unofficial. The last ones submitted were departmental (2009-2010). The goals of the departments were essentially the same as portions of the Master Plan:

Goal One: Provide learning programs and an environment that ensures student success.

Objective 1.1-Expand and/or revise the curriculum to meet the dynamic needs of students and community. Specifically we address Action 2 in the Plan which states "Develop student skills that promote lifelong learning with competencies in computer literacy, oral and written communication, and critical and analytical thinking." These are emphasized in the student learning outcomes. Natural Science/Mathematics offers a wide variety of courses, each of which is unique in its treatment of diverse topics. Many of the courses have a laboratory component that gives instructors the unique opportunity to really know and work with their students. The laboratory environment promotes teamwork and student-student and student-instructor interactions. Many students have difficulty with their initial science and math courses and BCC has a viable and productive tutoring center for students in need of additional help outside the classroom.

Objective 1.3- Support flexible pedagogies designed to improve student learning and achievement.

Objective 1.5- Develop learning support systems that are effective and flexible to meet changing student needs and enrollment growth. In particular, Action 2, "Enhance collaboration between tutorial services and faculty" by donating instructor copy textbooks and recommending tutors to the Center.

Objective 1.6- Provide modern facilities and classrooms with integrated technologies that support learning programs and accommodate projected student growth. Faculty have been provided with training for both live and online delivery.

Goal Four: Create an effective work environment

Objective 4.1- Enhance college wide dialog and develop a more effective link between department and institutional goals. Action 4 emphasizes planning sessions, objectives, and measurable outcomes contained in a program review.

Goal Five: Improve college programs through systematic evaluation.

Objective 5.2- Align courses and programs with mission, overall curriculum and System's Office reporting taxonomies. Action 2 is adding student learning outcomes to the program template.

Objective 5.3- Include SLO assessment for online courses at all levels of evaluation.

The Natural Science and Mathematics Program has met or exceeded all of the above stated goals from the last composite program reviews of the individual departments (Biology, Chemistry, Earth Science, and Mathematics).

8. Goals/Objectives/Actions

Reflect on the responses to all the previous questions.

- Formulate Program **Goals** to maintain or enhance program strengths, or to address identified weaknesses.
- Indicate how each Goal is **Aligned** with the College's **Strategic Priorities**.
- Identify explicit **Objectives** for reaching each goal.
- Create a three-year **Action Plan** consisting of a coherent set of specific steps that must be taken to achieve each objective.
- Develop **Outcome** statements and appropriate measures for each objective.
- The **Comments** area provides for the additional communication of information necessary to further "close the loop" on the goal or action plan, as it relates to **Institutional Planning**. This may include references to other institutional documents, such as **governing or compliance documents** *(i.e. Board Policy, BAM, Title V)*, **institutional planning documents** *(i.e. Strategic Plan, Educational Master Plan, Facilities Plan, Technology Plan)*, or **Board, Presidential, Supervisory or Departmental recommendations or goals**, **etc.**

As you create your Program **Goals**, **Objectives, Outcomes** and **Action Plan**, it might be helpful to think about some of the following questions:

- Imagine your Program three years from now in an ideal future. You and your colleagues have done everything you possibly can to make the Program excellent. Look around: What do you see?
- Describe the colleagues and partners inside and outside the institution with whom you would like to work in the ideal future.
- In the ideal future, what specific innovations, best practices, or other accomplishments would you share with a visiting out-of-state colleague?
- What long-term impact would you like your Program to have on the College and the community?
- What strengths, opportunities, or new directions now exist on which you can capitalize in three years' time?

*Complete the following table with your Program's **Three Year Action Plan**.*

Action Plan				
GOAL	**ALIGNMENT**	**OBJECTIVE**	**ACTIONS/TASKS REQUIRED TO ACHIEVE**	**OUTCOMES/MEASURES**

				OBJECTIVE		
#1	Provide students a successful college learning experience; aligns with Strategic Priority #2.	1. Foster innovative learning environment 2. Provide Successful college learning experience 3. Promote and support student engagement 4. Cultivate and enhance local partnerships 5. Attract/ develop excellent employees 6. Strengthen college planning/ decision making	#1 Plan and implement programs based on learning needs and career paths	a)	Evaluate prerequisites	The COR is up to date and in compliance; the success and retention rates show improvement in critical areas; addition of new classes
				b)	Evaluate curriculum and add new classes as needed	
				c)		
			#2 Augment current and emerging technologies to foster student learning	a)	DE with new Moodle platform	Success, retention, and fill rates in online classes with the new more interactive platform. Student surveys on the use of computer simulations in labs
				b)	Use of smartboards, tablet pcs,etc.	
				c)	Computer simulations in the laboratory sciences	
				a)		
				b)		
				c)		
	Comments:	We have students who are not prepared for the rigor of either math or science. Our chemistry course has no prerequisite and weak math students flail and fail when they try to take chemistry. By putting a prerequisite of Math 55 we should be able to increase our success rate by not putting students in the class who are primed to fail.				
#2	Foster an innovative learning environment that respects diversity; aligns with Strategic Priority #1	1. Foster innovative learning environment 2. Provide Successful college learning experience 3. Promote and support student engagement 4. Cultivate and enhance local partnerships 5. Attract/ develop excellent employees 6. Strengthen college planning/ decision making	#1 Offer programs and services for individual student populations	a)	Counselor data on services	Number of transfers; counselor data concerning transfer agreements; degree requirements from 2 and 4-year schools and universities.
				b)	Curriculum data from 2 and 4 year schools	
				c)		
			#2 Advance a culture of inclusion that promotes and appreciates the human condition	a)	Measured with SLOs and PLOs	Analysis of the course level assessments and the program level assessments
				b)		
				c)		
				a)		
				b)		
				c)		
	Comments:	We need to make sure we have the best, if not the latest, equipment in the laboratory. Students need to be successful in the lab and working with antiquated or broken instrumentation is not the way to achieve success.				
		1. Foster		a)		

			innovative learning environment		b)		
					c)		
		2.	Provide Successful college learning experience		a)		
					b)		
					c)		
		3.	Promote and support student engagement		a)		
					b)		
		4.	Cultivate and enhance local partnerships		c)		
		5.	Attract/ develop excellent employees				
		6.	Strengthen college planning/ decision making				
	Comments:	By adding proper prerequisites and adhering to them should increase the success rates in the sciences.					

9. Resources Required

List all significant resources needed to achieve the objectives shown in the table above, including personnel, professional development, technology, information, marketing, equipment, supplies, and facilities. Every request for additional resources must support at least one objective.

Also list any resources required to implement planned improvements noted in 6.C.

Rationale*: For each resource listed, enter the reason(s) the resource is needed to achieve the objective.

Goal #	Objective #	Resource Required	Rationale*	Estimated Cost
		Microscopes	Replace 10+ old instruments	$60,000.00
		Vernier pH probes	Replace 12 broken or obsolete probes	$1200.00
		Water distiller	Water necessary for labs, currently purchased	$2000.00
		Math instructor	To replace instructor who left 2 years ago	$55,488 Salary $11,652 Benefits $15,900 Insur. Total= $83,040.00
		Earth Sciences Computer Software	Most of our old programs are no longer compatible with the computers in the lab	$2,500.00

		DVDs for Earth Sciences	All existing videos are "old" VCR and need to be updated	$1,500.00
		Printer in T-14 Lab	Old and breaks down often	$500.00
		Computers in T-14 Lab	17 new computers; old ones are 6 years old, out of warranty and breakdown often; can't accommodate software	$23,800.00
		Geology Equipment and Supplies	Need rock/mineral specimens, Brunton compasses, rock hammers, and maps (circa 1947)	$2,500.00
		Tablet PC for Math Instructor		
		Math Lab at Ft. Irwin with computers and math tutor		

A **BUDGET ALLOCATION PROPOSAL** must be completed and submitted for EACH new resource requested.

Budget Allocation Proposal

Originator:	Philip Nelson
Program or Department Name:	Natural Science/Math (Chemistry)
Dean/Vice President/Supervisor:	
Amount Requested:	$1500
Date:	October 20, 2012

One-time funding: ☑ **Ongoing Funding:** ☐

1) What are you requesting? Why is the request being made? Where was the need identified?

We are requesting the purchase of a 20 new Vernier pH probes for the Chem 1 class. The Vernier test system for chemistry and biology has been in place here since the late 90s. It is part of the lab package for Chemistry and is included in the lab manual we use.

This need was identified in the last Program Review that was done for the Chemistry Department in 2010 (before the Nat.Sci./Math Program Review).

2) Indicate how your request is supported by your:

a) Program Review/Annual Update

This supports Strategic Priority #2 that speaks to foster an innovative learning environment but more specifically part B: "Augment current and emerging technologies to foster student learning."

AND

b) Student Learning Outcomes/Program Learning Outcomes/Service Area Outcomes

The proposal supports SLOs #1 and #2 in the Chemistry department and PLOs #1 and #2 for the Natural Science/Mathematics degree program.

SLO#1: To provide students with accurate and relevant chemical information.

SLO#2: Provide students with an introduction to standard laboratory methods and an ability to execute basic chemical experiments.

PLO#1: Demonstrate a knowledge of natural phenomena and recognize the processes that explain them.

PLO#2: Demonstrate a knowledge of scientific methodologies when solving a problem.

3) Describe the goal(s) for this proposal. How will this impact students or institutional services?

The Vernier system gives the student a chance to perform sophisticated chemical experiments that they otherwise would not be able to accomplish here at BCC. Students would be able to use state of the art equipment that will help them when they transfer in that they will have been exposed to hands on experimentation.

4) What are some measurable outcomes that will lead to meeting this goal(s)?

We should see an increase in test scores in the laboratory where the Vernier is used. This would lead to a more successful student in the course itself since the lab counts anywhere from 25% of grade.

5) What steps will be taken or need to be taken to implement this proposal?

The only special step needed would be for the MIS Department to load the software onto the lab computers.

(Much of the material in this form has been adapted from resources available at the Mt. San Jacinto College website.)

6) Describe how your request is aligned with the college's Strategic Priorities:

1. Foster an innovative learning environment that respects diversity. a. Offer programs and services for emerging student populations that are appropriate to and in support of individual students' needs. b. Advance a culture of inclusion that respects and appreciates the human condition.
See above
2. Provide students a successful college learning experience. a. Plan and implement instructional programs based upon student learning needs and career paths. b. Augment current and emerging technologies to foster student learning in on-campus and alternative learning modalities.
See above
3. Promote and support student engagement. a. Facilitate student growth and development by assisting students to set, monitor and evaluate educational goals. b. Expand and sustain an efficient, attractive and welcoming campus environment that supports teaching and learning.
4. Cultivate and enhance local partnerships. a. Market and enhance the college image in high desert region and on the world wide web. b. Promote positive community and economic growth through greater outreach to local schools, business and industry, governments, service organizations and military.
5. Attract, retain, and develop excellent employees. a. Implement practices to attract a diverse pool of highly qualified applicants for employment opportunities. b. Provide employees with a wide range of training and development opportunities to foster their professional growth.
6. Strengthen college planning and informed decision-making. a. Maximize physical, human, fiscal and technological resources using program review and outcomes assessment results. b. Expand interactions and collaborations among faculty and staff using data and evidence.

Budget Allocation Proposal

Originator:	Scott Bulkey
Program or Department Name:	Natural Science/Math (Geology)
Dean/Vice President/Supervisor:	
Amount Requested:	$9,000.00
Date:	October 20, 2012

One-time funding: ☑ **Ongoing Funding:** ☐

1) What are you requesting? Why is the request being made? Where was the need identified?

We are requesting the purchase of new rock/mineral specimens, Brunton compasses, rock hammers, and maps for geology. We do not have enough specimens, compasses, or rock hammers for the students to use. Also, our geological maps are circa 1947, and therefore, out of date.

This need is identified in the most current Program Review for the Natural Science/Math degree program.

2) Indicate how your request is supported by your:

a) Program Review/Annual Update

This supports Strategic Priority #2 that speaks to foster an innovative learning environment but more specifically part B: "Augment current and emerging technologies to foster student learning."

AND

b) Student Learning Outcomes/Program Learning Outcomes/Service Area Outcomes

The proposal supports SLOs #1 and #3 in the Geology department and PLOs #1 and #2 for the Natural Science/Mathematics degree program.

SLO#1: Demonstrate orally, and in written form, understanding of the processes of science, the scientific method, and the relationship between scientific research and established knowledge.

SLO #3: Demonstrate evaluation of data, draw reasonable conclusions, recognize the ethical implications of these conclusions, if applicable, and apply these conclusions to personal, community, or scientific problems.

PLO#1: Demonstrate a knowledge of natural phenomena and recognize the processes that explain them.

PLO#2: Demonstrate a knowledge of scientific methodologies when solving a problem.

3) Describe the goal(s) for this proposal. How will this impact students or institutional services?

This equipment is used extensively in many of the geology and earth science classes. .

This will give the student an opportunity to do hands-on work in the laboratory and in the field.

4) What are some measurable outcomes that will lead to meeting this goal(s)?

We would hope this would lead to more success in the classroom and should be seen in both retention and success scores.

5) What steps will be taken or need to be taken to implement this proposal?

None

(Much of the material in this form has been adapted from resources available at the Mt. San Jacinto College website.)

6) Describe how your request is aligned with the college's Strategic Priorities:

1. Foster an innovative learning environment that respects diversity. a. Offer programs and services for emerging student populations that are appropriate to and in support of individual students' needs. b. Advance a culture of inclusion that respects and appreciates the human condition.
See above
2. Provide students a successful college learning experience. a. Plan and implement instructional programs based upon student learning needs and career paths. b. Augment current and emerging technologies to foster student learning in on-campus and alternative learning modalities.
See above
3. Promote and support student engagement. a. Facilitate student growth and development by assisting students to set, monitor and evaluate educational goals. b. Expand and sustain an efficient, attractive and welcoming campus environment that supports teaching and learning.
4. Cultivate and enhance local partnerships. a. Market and enhance the college image in high desert region and on the world wide web. b. Promote positive community and economic growth through greater outreach to local schools, business and industry, governments, service organizations and military.
5. Attract, retain, and develop excellent employees. a. Implement practices to attract a diverse pool of highly qualified applicants for employment opportunities. b. Provide employees with a wide range of training and development opportunities to foster their professional growth.
6. Strengthen college planning and informed decision-making. a. Maximize physical, human, fiscal and technological resources using program review and outcomes assessment results. b. Expand interactions and collaborations among faculty and staff using data and evidence.

Budget Allocation Proposal

Originator:	Robert Stinson and Bret Sage
Program or Department Name:	Natural Science/Math (Biology)
Dean/Vice President/Supervisor:	
Amount Requested:	$60,000
Date:	October 20, 2012

One-time funding: ☐ **Ongoing Funding:** ☑

1) What are you requesting? Why is the request being made? Where was the need identified?

We are requesting the purchase of 20 new student grade microscopes for the biology laboratories. The current microscopes are over 10 years old and are in constant need of repair. We have them serviced every summer but they are not lasting. They are used in numerous classes and take a severe beating from the students.

The need was originally identified in the last 2 Program Reviews.

We would propose purchasing the microscopes over a three year period to reduce the impact of the cost.

2) Indicate how your request is supported by your:

a) Program Review/Annual Update

This supports Strategic Priority #2 that speaks to foster an innovative learning environment but more specifically part B: "Augment current and emerging technologies to foster student learning."

AND

b) Student Learning Outcomes/Program Learning Outcomes/Service Area Outcomes

The proposal supports SLOs #1 and #3 in the Biology department and PLOs #1 and #2 for the Natural Science/Mathematics degree program.

SLO #1: By the end of this course the successful student will know or be able to demonstrate orally, and in written form, understanding of the processes of science, the scientific method, and the relationship between scientific research and established knowledge.

SLO#3: By the end of this course the successful student will know or be able to demonstrate evaluation of biological data, draw reasonable conclusions, recognize the ethical implications, if applicable, and apply these conclusions to personal, community, or scientific problems.

PLO#1: Demonstrate a knowledge of natural phenomena and recognize the processes that explain them.

PLO#2: Demonstrate a knowledge of scientific methodologies when solving a problem.

3) Describe the goal(s) for this proposal. How will this impact students or institutional services?

These microscopes would replace the worn-out microscopes we currently use. Microscopy is a vital part of almost all of the biological sciences. In particular, Human Anatomy and Microbiology are probably the heaviest users of microscopes and they are essential to the success of those classes. In addition, we use microscopes in Concepts in Biology, Intro. to Biology, and Human Physiology.

Students would be able to use state of the art equipment that will help them when they transfer.

4) What are some measurable outcomes that will lead to meeting this goal(s)?

We should see an increase in test scores in the laboratory where the microscope is used. This would lead to a more successful student in the course itself since the lab counts anywhere from 25-33% of grade.

5) What steps will be taken or need to be taken to implement this proposal?

There are no special steps that need to be taken; microscopes generally come ready to use.

(Much of the material in this form has been adapted from resources available at the Mt. San Jacinto College website.)

6) Describe how your request is aligned with the college's Strategic Priorities:

1. Foster an innovative learning environment that respects diversity. a. Offer programs and services for emerging student populations that are appropriate to and in support of individual students' needs. b. Advance a culture of inclusion that respects and appreciates the human condition.
See above
2. Provide students a successful college learning experience. a. Plan and implement instructional programs based upon student learning needs and career paths. b. Augment current and emerging technologies to foster student learning in on-campus and alternative learning modalities.
See above
3. Promote and support student engagement. a. Facilitate student growth and development by assisting students to set, monitor and evaluate educational goals. b. Expand and sustain an efficient, attractive and welcoming campus environment that supports teaching and learning.
4. Cultivate and enhance local partnerships. a. Market and enhance the college image in high desert region and on the world wide web. b. Promote positive community and economic growth through greater outreach to local schools, business and industry, governments, service organizations and military.
5. Attract, retain, and develop excellent employees. a. Implement practices to attract a diverse pool of highly qualified applicants for employment opportunities. b. Provide employees with a wide range of training and development opportunities to foster their professional growth.
6. Strengthen college planning and informed decision-making. a. Maximize physical, human, fiscal and technological resources using program review and outcomes assessment results. b. Expand interactions and collaborations among faculty and staff using data and evidence.

Budget Allocation Proposal

Originator:	Scott Bulkey
Program or Department Name:	Natural Science/Math (Geology)
Dean/Vice President/Supervisor:	
Amount Requested:	$24,000
Date:	October 20, 2012

One-time funding: ☑ **Ongoing Funding:** ☐

1) What are you requesting? Why is the request being made? Where was the need identified?

We are requesting the purchase of 17 new computers for the T-14 laboratory. The current computers are out of date and in need of continual repair.

This need is identified in the current Program Review for Natural Science/Math.

2) Indicate how your request is supported by your:

a) Program Review/Annual Update

This supports Strategic Priority #2 that speaks to foster an innovative learning environment but more specifically part B: "Augment current and emerging technologies to foster student learning."

AND

b) Student Learning Outcomes/Program Learning Outcomes/Service Area Outcomes

The proposal supports SLOs #1 and #3 in the Geology department and PLOs #1 and #2 for the Natural Science/Mathematics degree program.

SLO #1: Demonstrate orally, and in written form, understanding of the processes of science, the scientific method, and the relationship between scientific research and established knowledge.

SLO #3: Demonstrate evaluation of data, draw reasonable conclusions, recognize the ethical implications of these conclusions, if applicable, and apply these conclusions to personal, community, or scientific problems.

PLO#1: Demonstrate a knowledge of natural phenomena and recognize the processes that explain them.

PLO#2: Demonstrate a knowledge of scientific methodologies when solving problems.

3) Describe the goal(s) for this proposal. How will this impact students or institutional services?

The computers are used extensively in many of the geology and earth science classes. Sophisticated software is used in astronomy, for example, and this software needs fast up to grade computers to run.

This will give the student an opportunity to use software and perform elaborate experiments necessary for success in this field of study.

4) What are some measurable outcomes that will lead to meeting this goal(s)?

We would hope this would lead to more success in the classroom and should be seen in both retention and success scores.

5) What steps will be taken or need to be taken to implement this proposal?

Installation of the computers by the MIS Department and loading of the software would be necessary.

(Much of the material in this form has been adapted from resources available at the Mt. San Jacinto College website.)

6) Describe how your request is aligned with the college's Strategic Priorities:

1. Foster an innovative learning environment that respects diversity. a. Offer programs and services for emerging student populations that are appropriate to and in support of individual students' needs. b. Advance a culture of inclusion that respects and appreciates the human condition.
See above
2. Provide students a successful college learning experience. a. Plan and implement instructional programs based upon student learning needs and career paths. b. Augment current and emerging technologies to foster student learning in on-campus and alternative learning modalities.
See above
3. Promote and support student engagement. a. Facilitate student growth and development by assisting students to set, monitor and evaluate educational goals. b. Expand and sustain an efficient, attractive and welcoming campus environment that supports teaching and learning.
4. Cultivate and enhance local partnerships. a. Market and enhance the college image in high desert region and on the world wide web. b. Promote positive community and economic growth through greater outreach to local schools, business and industry, governments, service organizations and military.
5. Attract, retain, and develop excellent employees. a. Implement practices to attract a diverse pool of highly qualified applicants for employment opportunities. b. Provide employees with a wide range of training and development opportunities to foster their professional growth.
6. Strengthen college planning and informed decision-making. a. Maximize physical, human, fiscal and technological resources using program review and outcomes assessment results. b. Expand interactions and collaborations among faculty and staff using data and evidence.

Budget Allocation Proposal

Originator:	Robert Stinson and Bret Sage
Program or Department Name:	Natural Science/Math (Biology)
Dean/Vice President/Supervisor:	
Amount Requested:	$7500
Date:	October 20, 2012

One-time funding: ☑ **Ongoing Funding:** ☐

1) What are you requesting? Why is the request being made? Where was the need identified?

We are requesting the purchase of a new Bio-Pac system. The system in place has been here since the early 90s. It is part of the lab package for Human Physiology and is included in the lab manual we use.

This need was identified in the last Program Review that was done for the Biology Department in 2010 (before the Nat.Sci./Math Program Review).

2) Indicate how your request is supported by your:

a) Program Review/Annual Update

This supports Strategic Priority #2 that speaks to foster an innovative learning environment but more specifically part B: "Augment current and emerging technologies to foster student learning."

AND

b) Student Learning Outcomes/Program Learning Outcomes/Service Area Outcomes

The proposal supports SLOs #1 and #3 in the Biology department and PLOs #1 and #2 for the Natural Science/Mathematics degree program.

SLO #1: By the end of this course the successful student will know or be able to demonstrate orally, and in written form, understanding of the processes of science, the scientific method, and the relationship between scientific research and established knowledge.

SLO#3: By the end of this course the successful student will know or be able to demonstrate evaluation of biological data, draw reasonable conclusions, recognize the ethical implications of these conclusions, if applicable, and apply these conclusions to personal, community, or scientific problems.

PLO#1: Demonstrate a knowledge of natural phenomena and recognize the processes that explain them.

PLO#2: Demonstrate a knowledge of scientific methodologies when solving a problem

3) Describe the goal(s) for this proposal. How will this impact students or institutional services?

Bio-Pac allows the students to do physiological experiments that they would not otherwise be exposed to. They do brain waves, ECG, reflexes, muscle contraction and fatigue, and respiratory volumes.

Students would be able to use state of the art equipment that will help them when they transfer in that they will have been exposed to hands on experimentation.

4) What are some measurable outcomes that will lead to meeting this goal(s)?

We should see an increase in test scores in the laboratory where the Bio-Pac is used. This would lead to a more successful student in the course itself since the lab counts anywhere from 25-33% of grade.

5) What steps will be taken or need to be taken to implement this proposal?

The only special step needed would be for the MIS Department to load the software onto the lab computers. We have used the Bio-Pac for many years.

(Much of the material in this form has been adapted from resources available at the Mt. San Jacinto College website.)

6) Describe how your request is aligned with the college's Strategic Priorities:

1. Foster an innovative learning environment that respects diversity. a. Offer programs and services for emerging student populations that are appropriate to and in support of individual students' needs. b. Advance a culture of inclusion that respects and appreciates the human condition.
See above
2. Provide students a successful college learning experience. a. Plan and implement instructional programs based upon student learning needs and career paths. b. Augment current and emerging technologies to foster student learning in on-campus and alternative learning modalities.
See above
3. Promote and support student engagement. a. Facilitate student growth and development by assisting students to set, monitor and evaluate educational goals. b. Expand and sustain an efficient, attractive and welcoming campus environment that supports teaching and learning.
4. Cultivate and enhance local partnerships. a. Market and enhance the college image in high desert region and on the world wide web. b. Promote positive community and economic growth through greater outreach to local schools, business and industry, governments, service organizations and military.
5. Attract, retain, and develop excellent employees. a. Implement practices to attract a diverse pool of highly qualified applicants for employment opportunities. b. Provide employees with a wide range of training and development opportunities to foster their professional growth.
6. Strengthen college planning and informed decision-making. a. Maximize physical, human, fiscal and technological resources using program review and outcomes assessment results. b. Expand interactions and collaborations among faculty and staff using data and evidence.