Introduction
Biology

Purpose

An effective program review supports continuous quality improvement to enhance student learning outcomes and, ultimately, increase student achievement rates. Program review aims to be a sustainable process that reviews, discusses, and analyzes current practices. The purpose is to encourage program reflection, and to ensure that program planning is related to goals at the institutional and course levels.

Process

Foothill College academic programs that lead to an A.A./A.S. or Certificate(s), or are part of a specialized pathway, such as ESL, Developmental English, Math My Way are reviewed annually with an in-depth review occurring on a three-year cycle. The specialized pathways may be included as part of the program review for the department, or may be done as a separate document if they are not part of a department that offers a degree or certificate. Faculty and staff in contributing departments will participate in the process. Deans provide feedback upon completion of the template and will forward the program review on to the next stage of the process, including prioritization at the Vice Presidential level, and at OPC and PaRC.

Annual review will address five core areas, and include a place for comments for the faculty and the dean or director.

1. Data and trend analysis
2. Outcomes assessment
3. Program goals and rationale
4. Program resources and support
5. Program strengths/opportunities for improvement
6. Dean/Administrator's comments/reflection/next steps
7. Vice President Comments

2012-2013 Submission Deadline:

- Program review documents are due to Dean by December 14 for completion of Section 6.
- Dean completes section 6 and forwards documents to Vice President for completion of Section 7 by January 4, 2013.
- Vice President completes section 7 and returns documents to program review team by January 18, 2013.
- Program review documents are due to the Office of Instruction by January 25, 2013.

Foothill College Program Review Cycle:

To see which template your department is scheduled to complete, check the Program Review Schedule: http://foothill.edu/staff/irs/programplans/2012-2013/12-13-prog-rev-schedule.pdf

Questions?

Contact: Office of Instruction and Institutional Research (650) 949-7240
Website: http://foothill.edu/staff/irs/programplans/index.php

Basic Program Information

Department Name: **Biology**

Program Mission(s):

1. Prepare students for a successful career in the biological sciences, including students planning to transfer to a four-year school.
2. Prepare students to be savvy consumers of scientific information, and provide a general education in the life sciences.
3. Provide students with the background knowledge and critical thinking skills required to understand important issues such as environmental science, climate change, evolution, disease prevention and basic nutrition.
4. Support programs in allied health by providing an education in biological principles including anatomy, physiology, microbiology, nutrition and pharmacology.

Program Review team members:

Name	Department	Position
Kathleen Duncan	Biology	Faculty
Amy Edwards	Biology	Faculty
Karen Erickson	Biology	Faculty
Carolyn Holcroft	Biology	Faculty
Joanne Lopez	Biology	Faculty
Martin Melia	Biology	Faculty
Lisa Schultheis	Biology	Faculty
Gillian Schultz	Biology	Faculty

Total number of Full Time Faculty:	8
Total number of Part Time Faculty:	Roughly 16

Existing Classified positions:
Lab Technician, FT; supports all aspects of department
Lab Technician, PT (40%); supports classes in 5100, mainly microbiology

Programs* covered by this review

Program Name	Program Type (AS, CA, Pathway, etc.)	Units**
Biology	A.S.	48
Allied Health Support	Pathway	N/A
GE Natural Sciences	Pathway	N/A
Nanoscience	Pathway	N/A

*If you have a supporting program or pathway in your area for which you will be making resource requests, please analyze it within this program review. For example, ESLL, Math My Way, etc. You will only need to address those data elements that apply.

Section 1. Data and Trend Analysis

1.1. Program Data

Data will be posted on http://foothill.edu/staff/irs/programplans/programreviewdata.php for all measures except non-transcriptable completion. Please attach all applicable data sheets to the final Program Review document submitted to your Dean. You may use the boxes below to manually copy data if desired.

Transcriptable Program	2010-2011	2011-2012	% Change
A.S. Biological Science	11	15	+36.4%

Please provide any non-transcriptable completion data you have available. Institutional Research does not track this data.

Non-Transcriptable Program	2010-2011	2011-2012	% Change
N/A			

1.2 Department Data (Attach data provided by IR or manually complete chart below)

Dimension	2010-2011	2011-2012	% Change
Enrollment	4,364	4,585	+ 5.1%
Productivity (Goal: 546)	656	651	- 0.7%
Success	80%	79%	- 1.2%
Full-time FTEF	5.9	6.7	13.6%
Part-time FTEF	8.3	8.2	- 1.2%

Department Course Data (Attach data provided by IR or manually complete chart below)

	2010-2011			2011-2012		
Course	**Enroll.**	**Prod.**	**Success**	**Enroll.**	**Prod.**	**Success**
Biol 1A	219	558	90%	228	581	84%
Biol 1B	157	544	88%	181	627	92%
Biol 1C	153	591	92%	139	537	93%
Biol 1D	18	270	76%	12	180	67%
Biol 8*	62	465	65%	119	447	66%
Biol 9	125	936	84%	114	854	69%
Biol 9L	42	412	98%	44	431	71%
Biol 10	631	817	73%	613	697	72%
Biol 12	129	644	70%	159	794	74%
Biol 13	64	451	62%	62	437	61%
Biol 14	195	794	70%	228	696	73%
Biol 15	29	483	79%	27	450	77%
Biol 40A	730	825	73%	737	825	75%
Biol 40B	554	664	86%	599	706	77%
Biol 40C	462	615	88%	452	739	88%
Biol 41	469	575	81%	477	553	80%
Biol 45	186	557	84%	263	565	91%
Biol 54H	18	273	61%	39	295	79%
Biol 58	121	906	86%	92	689	87%

1.3 Narrative Analysis

1. Enrollment trends over the last two years: Is the enrollment in your program holding steady, or is there a noticeable increase or decline? Please comment on the data and analyze the trends.

   Our enrollment overall has increased by 5.1% (0.8% biology majors, 2.9% general education, and 1.3% allied health support courses). This is significantly different than the campus enrollment trend (no change, 0%). Comparing the biology department to our division (8.4% increase), we clearly need to grow to more fully support the allied health programs. Note that this growth will not be possible without additional B budget and full time faculty.

a. Please analyze the data and comment with regards to student ethnicity, gender, age and highest degree.

ETHNICITY: Enrollment in the 2011-2012 academic year shows a student population with a similar composition to the campus.

Ethnic Group	Department	Campus
Targeted groups	27.8%	27.3%
Latino/Latina	15.5%	18.1%
Filipino	8.7%	3.8%
African American	3.5%	5.3%
Not targeted groups	65.4%	61.2%
Asian	34.5%	24.9%
Caucasian	29.7%	34.3%
Native American	0.5%	0.8%
Pacific Islander	0.6%	1.2%

GENDER: The distribution of male and female students is quite different in our department compared to the campus. Our department has a higher percentage of females(63.5% female, 36.5% male for our department; 54% female, 44% male for the campus).

AGE: With respect to age, our enrollment pattern is different than the campus. Note that in our department students 20-39 years old make up 80.3% of our enrollment; while the campus has only 54% of students in this age group.

Age Group	Department	Campus
19 and younger	12.5%	19%
20 to 24 years	47%	36%
25 to 39 years	33.3%	27%
40 and older	7.2%	18%

DEGREE: We have a larger proportion of students returning with a bachelor's degree compared to the campus (27% in our department, 18% for the campus).

2. Completion Rates: Has the number of students completing degrees/certificates held steady, or increased or declined in the last two years? Please comment on the data and analyze the trends, including completion rates by student demographic.

While the number of degrees awarded remains small, our department enjoyed a 36% increase in AS degrees in the last two years.

a. AA, AS, transcriptable certificates: The biology department awarded 11 AS degrees in the 2010-11 academic year and 15 in the 2011-12 academic year. The majority of students in our program are primarily interested in completing their UC/IGETC transfer requirements, preparing to transfer into a biology majors program, or preparing to enter a vocational program in allied health, veterinary technology, or environmental horticulture. Thus, our students typically do not pursue a Foothill degree. With the option of an AS-T degree, however, we anticipate this number to increase significantly.
b. Local, non-State approved certificates: N/A
c. Certificates fewer than 27 units: N/A

3. Productivity: Please analyze the productivity trends in your program and explain factors that affect your productivity, i.e. GE students, size restrictions. For reference, the college productivity goal is 546.

   The biology department's productivity continues to exceed the college goal by a substantial amount. Our productivity for the 2010-2011 academic year was 656 and for the 2011-2012 academic year was 651, a 1% decline. This is significantly different than the campus productivity, which has decreased by 8%, and the division productivity, which has decreased by 4%.

   A comparison of the department's productivity to the campus productivity goal highlights the strength of our program. About half of our majors and G.E. courses exceed the campus goal. Our most productive courses are the allied health support courses, all of which surpass the campus productivity goal. In particular, the anatomy and physiology courses currently range between 706 and 825 in productivity. Note that this is the area we have targeted for growth to support the division's increased enrollment. We currently are trying to hire another full time instructor for these courses.

   The courses with the lowest productivity meet very specific goals for supporting our students' needs. Our department has chosen to support these specialized courses despite their lower productivity.

4. Course Offerings (Comment on the frequency, variety, demand, pre-requisites.) Review the enrollment trends by course. Are there particular courses that are not getting the enrollment or are regularly cancelled due to low enrollment?)

Biol 1A	Principles of Cell Biology is the first course in the Biology major's series (AS/Transfer) Exceeded college productivity goal of 546 (581). Enrollment increased 4% (n=9) between 10-11 and 11-12. This course is offered FWS and includes both day sections and night sections. We currently want to restructure the fall offerings to mimic the winter, thus increasing the sections by one.
Biol 1B	Form and Function in Plants and Animals is the second course in the Biology major's series (AS/Transfer). Exceeded college productivity goal of 546 (627). Enrollment increased 15% (n=24) between 10-11 and 11-12. This course is offered FWS and includes both day and night sections.

	A prerequisite of Biology 1A was added to the course which resulted in a 4% increase in student success.
Biol 1C	Evolution, Systematics and Ecology is the third course in the Biology major's series (AS/Transfer). Nearly reached college productivity goal of 546 (537). Enrollment declined 9% (n=14) between 10-11 and 11-12. This course is offered FWSM and includes only day sections due to field trips during labs. A prerequisite of Biology 1B was added to the course which resulted in a 1% increase in student success and is partially responsible for the decline in enrollment. Also note that students beginning the series in the winter will often transfer before taking Biology 1C.
Biol 1D	Introduction to Molecular Genetics is the fourth course in the Biology major's sequence (Transfer). Below college productivity goal of 546 (180). Low productivity is due to low enrollment (typically 16-20 students). This course is offered Spring quarter (one day section) and it has a prerequisite of Biology 1A. The course is highly specialized, meeting the needs of a select group of students (required for certain transfer students who are Biology majors and is a core requirement for the Nanoscience program). Plans to improve enrollment include direct advertisement for this course to recapture physics and biochemistry graduate students from Bay area universities. Graduate students from Stanford and San Jose State have previously used our course to get a quick introduction to molecular genetics. Biology 1C students have put up fliers in the graduate division offices in the quarters when these students enrolled in Biology 1D. We are also considering adding a biology elective requirement for the AS biology degree.
Biol 8	Basic Nutrition fulfills AS elective requirements, satisfies the CSU Area E (Lifelong Learning) GE requirement and is one of two online biology courses. Below college productivity goal of 546 (447). Our online courses are writing intensive and thus have a lower enrollment and, therefore, productivity. Enrollment increased 92% (n=57) between 10-11 and 11-12. This course is offered online all four quarters. Demand for Biology 8 was high (F 2011) and an additional section was added which resulted in an increase in enrollment.
Biol 9	Environmental Biology satisfies the Lifelong Learning GE (without the lab) and the Natural Science GE (when taken with the lab). It is a popular class that supports our campus sustainability focus. Exceeded college productivity goal of 546 (854) - highest in the department. Enrollment declined 9% (n=11) between 10-11 and 11-12. This course is offered in FW.
Biol 9L	Environmental Biology Laboratory satisfies the Natural Science GE (when taken with the lecture). Modest productivity is supported due to the need to provide laboratory experience in this important field of study and is more than balanced by the productivity in the lecture. Enrollment increased 5% (n=2) between 10-11 and 11-12.
Biol 10	General Biology satisfies the Natural Science GE requirement. Exceeded college productivity goal of 546 (697). Biol 10 made up 48 % of the GE enrollment in 2011, and 43% in 2012. Enrollment in this course decreased 3% (n=18). This course is normally offered all four quarters with night sections in the FWS, as well as sections that meet throughout the day (early morning, midday, and afternoon). In 2011 we purposefully slightly reduced the number of annual offerings of this course to help diversify enrollment in other GE Natural Science Biology Courses. This succeeded in increasing the enrollment in Biol 9 and Biol 14.
Biol 12	Human Genetics satisfies the Lifelong Learning GE requirement. Exceeded college productivity goal of 546 (794). Enrollment increased 23% (n=30) between 10-11 and 11-12. This course is offered FWS during the day. There is some discussion about adding a new section to our night offerings.
Biol 13	Marine Biology satisfies the Natural Science GE requirement. Below college productivity goal of 546 (437). Enrollment declined 3% (n=2) between 10-11 and 11-12. This course is offered FS. This course is relatively low enrolled each year. The department is exploring ways to increase enrollment, with a few suggestions being offered. The course was altered several years ago due to a

	lack of lab space, to be taught with 100% of the labs being field trips. We may need to revisit this, and possibly consider structuring the course similar to Biol 9, where the lab is optional. We cannot explore this further until after the 5100 building remodel is complete, since currently have a lab space restriction. Note that we may elect to keep the course as is, to support field experience. With the high productivity in other GE courses, we feel it is appropriate to continue supporting specialized courses.
Biol 14	Human Biology satisfies the Natural Science GE requirement. Exceeded college productivity goal of 546 (696). Enrollment increased 17% (n=33) between 10-11 and 11-12. This course is offered FWS during the day. In fall 2011 we added night sections to diversify our nighttime GE Natural Sciences Offerings. We will continue to offer an evening section in the future.
Biol 15	California Ecology/Natural History satisfies the Natural Science GE requirement. Below college productivity goal of 546 (450). Enrollment declined 7% (n=2) between 10-11 and 11-12. This course is only offered in the Spring quarter and offers students field experience. Our department has elected to keep the course as is, to support field experience. With the high productivity in other GE courses, we feel it is appropriate to continue supporting specialized courses.
Biol 40A	Human Anatomy and Physiology I is the first course in the series and supports Allied Health programs. Exceeded college productivity goal of 546 (825). Enrollment increased 1% (n=7) between 10-11 and 11-12. We offer this course every quarter (FWSM) and offer sections during the day, evenings and weekends.
Biol 40B	Human Anatomy and Physiology II is the second course in the series and supports Allied Health programs. Exceeded college productivity goal of 546 (706). Enrollment increased 8% (n=45) between 10-11 and 11-12. We offer this course every quarter (F,W,S,M) and offer sections during the day, evenings and weekends.
Biol 40C	Human Anatomy and Physiology III is the third and and supports Allied Health programs. Exceeded college productivity goal of 546 (739). Enrollment declined 2% (n=10) between 10-11 and 11-12. We offer this course every quarter (FWSM) and offer sections during the day, evenings and weekends.
Biol 41	Microbiology supports Allied Health programs, satisfies Area III of the Foothill GE pattern, and satisfies the IGETC Physical and Biological Sciences requirement. Exceeded college productivity goal of 546 (553). Enrollment increased 2% (n=8) between 10-11 and 11-12. We offer this course every quarter (FWSM) and offer sections during the day and evenings. We are currently teaching the maximum number of sections of this course due to laboratory space, equipment, financial, and support personnel restrictions. Microbiology is our most expensive course, requiring significant lab tech support, expensive equipment and consumables. After the remodel of the 5100 building, the purchase of an additional set of 25 microscopes, an increase in hours for our micro-lab tech, and an increase in our B budget, we will be able to increase the number of lab sections to meet the strong demand for this course.
Biol 45	Introduction to Human Nutrition supports Allied Health programs and satisfies the IGETC Physical and Biological Sciences requirement. Exceeded college productivity goal of 546 (565). Enrollment increased 41% (n=77) between 10-11 and 11-12. An increase in enrollment reflects the benefits of offering this course all 4 quarters and adding an additional section in 11-12. This course is offered both online and face-to-face.
Biol 58	Fundamentals of Pharmacology supports Allied Health programs. Exceeded college productivity goal of 546 (689). Enrollment increased 24% (n=29) between 10-11 and 11-12. We offer this course in FS in the evening. This class was primarily designed as a prerequisite for the dental hygiene program at Foothill. However, over the years, it has gained popularity among students who are pre-nursing and other allied health programs but it is not a required pre-requisite.

Biol54H	Honors Institute Seminar in Biology is part of the College Honors program. Below college productivity goal of 546 (295). Honors courses have limited enrollment. We have just changed the number of this course to 54H as the course does not meet UC transferability requirements. Enrollment increased 117% (n=21) between 10-11 and 11-12. We have increased the offerings of this course in 11-12 to both F and W quarter.

5. Curriculum and SLOs
    a. Comment on the currency of your curriculum, i.e. are all CORs reviewed for Title 5 compliance at least every three years and do all prerequisites, co-requisites and advisories undergo content review at that time? If not, what is your action plan for bringing your curriculum into compliance? (Please use reports from the Curriculum Office to help you complete this prompt)

        All of our courses are reviewed for compliance at least every three years. In the past several years, we have not been completing content review as a part of the cyclical Title 5 compliance reviews. However, this issue has recently been brought to the attention of all Biological and Health Sciences division faculty and we understand that going forward we will be required to complete content review process.

    b. As a department/program, how do you ensure that all faculty are teaching to the COR?

        Biology faculty are evaluated every 3 years. Although the evaluation form doesn't specifically address adherence to the COR, it does address the course syllabus so this is an opportunity to identify potential problems. When part time faculty are hired they are provided with a copy of the COR for their course(s).

    c. Discuss how the objectives and outcomes in your courses relate to the program learning outcomes and to the college mission. (Recommendation: attach TracDat mapping report).

        The biology "program" outcomes are:
        - Upon successful completion of the Biology majors sequence, students can/will be able to use the scientific method to formulate questions, design experiments to test hypotheses, interpret experimental results to draw conclusions, communicate results both orally and in writing, and critically evaluate the use of the scientific method from published sources; and
        - Upon successful completion of the Biology majors sequence, students will be able to apply evolutionary theory at the molecular, cellular, organismal and population levels to explain the unity and diversity of life.

    d. If you are offering both an associate's degree and a certificate of achievement, please provide a rationale for offering both. If you are offering a local associate's degree and a transfer degree in the same discipline, please comment on your rationale for offering both.

We are currently awaiting the final version of the Transfer Model Curriculum for Biology and plan to develop a TMC-aligned AS-T in biology as soon as possible. When the TMC becomes available we'll be able to compare it to our local AS degree and make an informed decision about whether or not to keep the local degree. We do not offer a certificate of achievement in biology.

e. If you are offering any interdisciplinary or cross-listed courses or program, please comment on collaborative efforts such as team-teaching or learning communities.

We are currently collaborating with PSME to develop a new course called, "Cooking the Earth," which is to be cross-listed with physics and team-taught.

The biology department also collaborates with PSME to offer the AS degree, "General Studies – Science." In previous years, there has been significant demand for this program. This may be because it is broadly based and offers good transfer preparation, so it will be interesting to see if this demand continues once we begin to offer more transfer degrees. If so, there is interest from both biology faculty and PSME faculty in expanding the curriculum for this program, particularly with an emphasis on interdisciplinary study.

f. Comment on any recent developments in your discipline which may require modification of existing curriculum and/or the development of new curriculum.

There are no recent developments in biology that are so major they require immediate, out-of-cycle revisions to our CORs. Possible new curriculum plans are outlined in the "goals" section, below.

6. Basic Skills Programs (English, ESLL and Math). For more information about the Core Mission of Basic Skills, see the Basic Skills Workgroup website: http://foothill.edu/president/basicskills.php

N/A

7. Transfer Programs (if applicable). For more information about the Core Mission of Transfer, see the Transfer Workgroup website: http://foothill.edu/president/transfer.php
   a. Please analyze and discuss Transfer data regarding this program.
   b. Please analyze and discuss Articulation data regarding this program.
   c. Please discuss the status of your program's AS-T or AA-T degrees.

   We are currently awaiting the final version of the Transfer Model Curriculum for Biology and plan to develop a TMC-aligned AS-T in biology as soon as possible. When the TMC becomes available we'll be able to compare it to our local AS degree and make an informed decision about whether or not to keep the local degree. We do not offer a certificate of achievement in biology.

8. Workforce Programs (if applicable). For more information about the Core Mission of Workforce, see the Workforce Workgroup website: http://www.foothill.edu/president/workforce.php

   N/A

9. Student Equity: Foothill-De Anza Community College District Board policy and California state guidelines require that each California community college submit a report on the college's progress in achieving equity in five specific areas: access, course completion, ESLL and basic skills completion, degree and certificate completion, and transfer. For the latest draft of the Student Equity Report, please see the ESMP website: http://foothill.edu/staff/irs/ESMP/index.php
   a. To better inform the Student Equity efforts at Foothill College, please comment on any current outcomes or initiatives related to increasing outreach, retention and student success of underrepresented students in your program.

10. Innovation: Please comment on any innovative initiatives within your program, this could include areas regarding sustainability, stewardship of resources, collaboration, grants and/or curriculum.

    There is great interest in developing interdisciplinary curriculum, and service learning opportunities. We are currently developing an interdisciplinary course with Physics to explore the science behind climate change. Two of the biology faculty are actively involved in the stewardship and management of the California native plant garden, a teaching resource for the campus.

Section 2. Learning Outcomes Assessment Summary

2.1. Attach 2011-2012 Program Level – Four Column Report for PL-SLO Assessment from TracDat.

2.2 Attach 2011-2012 Course-Level – Four Column Report for CL-SLO Assessment from TracDat.

2.3 Please provide observations and reflection below.

2.3.a Course-Level SLO

1. Give an assessment of the past three years of annual Course Level SLO reflections.

   Looking at the past 3 years of assessments and reflections, most courses are regularly evaluated. There are some courses (primarily those taught exclusively by part-timers) for which there are no data entered. The department is confident that PTers are aware of what SLOs are and what their course SLOs are, but perhaps data entry is not being done. Having a coordinator (ie, chair) to help part-timers enter data into TracDat would alleviate most of these problems. Upon reflection, most resource requests are to ensure continued access to appropriate numbers of materials (ie, dissection speciments, microscopes) for small groups of students and to avoid having to share materials with too many others. Also, tutors, open lab space, or other such support services are a common theme.

2. If your program has other outcomes assessments at the course level, comment on the findings.

   No comment.

2.3.b Program-Level SLO

1. What summative findings can be gathered from the Program Level Assessments?

   There are two PL-SLOs for the "biology program" (the majors' sequence leading to an A.S. degree or, more often, to transfer to a four-year institution). One of the PL-SLOs (the scientific method) has been assessed and reflected upon. Over the course of one year, the students steadily improved their ability to work within the "confines" of the scientific method. Activities and assessments are felt to be adequate in each of the three majors' courses (Biol1A, 1B, 1C) in which the PL-SLOs are assessed. Slight tweaking and modifications are proposed. Unifying the projects has been done to a certain degree (this after a meeting with the principle instructors of these courses).

   Some coordination and possible curricular changes need to occur to ensure the second PL-SLO (evolution) is adequately measured. This is an ongoing department activity.

2. How has assessment of program-level student learning outcomes led to certificate/degree program improvements?

   The improvements include unification of the scientific method projects (as stated above), including an enhanced bibliography and reference section that is consistent across all three projects/courses. Possible changes to curricula in evolution are being discussed amongst the faculty members who teach these courses. These improvements are designed to strengthen student mastery of the two PL-SLOs.

3. If your program has other outcomes assessments at the program level, comment on the findings.

   No comment.

2.4 Annual Action Plan and Summary: Using the information above, list the program's action steps, the related Core Mission objective, SLO assessment data and the expected impact on student success.

Action Step	**Related SLO assessment (Note applicable data)**	**Related ESMP Core Mission Goals (Basic Skills, Transfer, Work Force, Stewardship of Resources)**	**How will this action improve student learning/success?**
1. Create a dedicated open-lab space specific for biology having pertinent laboratory materials available and for tutorial assistance outside of regular class hours	PL-SLO #1/Scientific Method: having this dedicated space will allow students to get assistance with their research projects, take measurements, and view any pertinent materials for their project.	Transfer of Biology Majors,	Students will have more one-on-one time, receive feedback, and have appropriate time to access necessary materials outside of the class time. This should increase their overall understanding of their project and how to apply the scientific method.
2. Same as above	There is no PL-SLO for non-majors or workforce support, however these are part of the core mission and align with the mission of the biology department. One open-lab space can serve many types of students.	Transfer of Non-Biology Majors, Workforce Support Classes	Students will have access to models, slides, and other such materials outside of their normal class time. This will allow increased time on task which should lead to deeper learning.

Section 3: Program Goals and Rationale

Program goals should be broad issues and concerns that incorporate some sort of measurable action and should connect to Foothill's core missions, Educational & Strategic Master Plan (ESMP), the division plan, and SLOs. Goals will be linked to resource requests.

3.1 Previous Program Goals from last academic year

Upon further reflection and discussion, the department feels our previous goals section 3 was not reflective of goals, but rather of resources (which is more appropriately entered into section 4). For this comprehensive program review, then, we met to discuss true program goals and entered them into section 3.2, below. Many of these goals were from prior years, even if they weren't officially documented.

Goal	**Original Timeline**	**Actions Taken**	**Status/Modifications**
1			
2			
3			

3.2 New Goals: Goals can be multi-year

Goals described as "Program" goals refer to those that directly affect the Biology majors program (leading to an A.S. degree). Goals described as "GE" refer to those impacting the GE/Natural Sciences mission of the department. Goals described as "General" are overall goals for all areas of the biology department.

Goal	**Timeline (long/short-term)**	**Supporting Action Steps from section 2.4 (if applicable)**	**How will this goal improve student success or respond to other key college initiatives**
1. Program Goal: complete AS-Transfer degree in Biology	Short-term		Intended to increase transfer rate.
2. Program Goal: design capstone course for majors	Short-term	Open-lab space allowing for student access to materials, including those useful for capstone projects	Intended to increase transfer rate.
3. Program Goal: increase involvement with PSME Division/STEM	Ongoing		Intended to increase transfer rate.
4. GE Goal: develop Honors course/increase involvement with Honors Program	Short-term		Intended to increase transfer rate.
5. General: develop interdisciplinary courses with other departments on	Ongoing		Connecting concepts and skills across a wide range of subjects will provide deeper

campus			learning and enhance student success.
6. General: maintain course offerings, scheduling diversity, and quality of instruction	Ongoing		Student success requires access - to courses and materials. Maintaining a variety of course offerings will allow students to fulfill their educational plans. This is in contrast to scheduling large classes with little flexibility for student schedules. Courses must maintain adequate supplies, tools, and equipment to provide hands-on educational opportunities to students in small lab groups.
7. General: address faculty teaching workload to allow time to accomplish other important departmental activities	Long-term		The five year average productivity for the biology department is 653 - exceeding the college goal of 546 by nearly 20%. The biology department insists the load factors be adjusted to realistically reflect work done in and out of the class/lab room. Load factors do not do justice to the time spent preparing, presenting, and grading lab work. Additionally, we strongly feel that our load factors should be consistent with other natural science courses offered at Foothill. These changes in load factor would initially reduce our productivity, but the department goal would be to maintain productivity at or above the campus goal.

			With some of our courses nearly 300 points above the campus goal, we should be able to meet both objectives of high productivity and fair, sustainable working conditions. This will allow time to work on all of the other professional duties associated with teaching and that are directly related to student success. These include, but are not limited to, developing new, and more hands-on, laboratory experiences, converting existing curriculum to an online format to increase student access, and developing new courses as outlined in this section.
8. General: build a community of biology learners	Ongoing		The department strongly feels that **community** should be part of a community college's mission. With the loss of support for "stand alone" classes, we acutely feel the loss of this mission. There are ways to address this, in the short term, that will support the overall goals of transfer and workforce, and we aspire to return to the goal of lifelong learning in the long term. Short term we can provide students with a dedicated learning space for them to focus on their biology studies. Long term we

			hope to create community-based courses in specific topics of interest.
9. General: develop service learning opportunities for biology students	Long-term		The department recognizes the value of service learning to enhance student understanding of concepts and principles in biology. Currently, the environmental biology course sometimes includes an informal service learning component in which students can opt to complete 12 hours of community service and reflective journal for an environmental organization to meet the class project requirement. Making this a more formal process by developing partnerships with local non profit and service organizations will help us to better place students, ensure that there are adequate opportunities for students and standardize the process so that any instructor could use it in their classes. Other service learning opportunities, in the form of internships, are also desired.
10: General: completely outfitting new micro lab with proper equipment/increased lab tech hours/new FT faculty	Short-term		The remodel of the 5100 building will begin in W13. Courses will be scheduled in the new labs beginning F13. Micro is one of our high-demand classes and we have maxed

			out the current lab space. With the new remodel, a second lab will be available to add additional micro sections, thus increasing enrollment (student access). For a new section of micro, the lab will minimally need 26 microscopes, 2 incubators, and 1 refrigerator. The 40% lab tech time will need to be increased to support higher enrollment. A new micro FT faculty member is needed.
11: General: Transform existing pedagogical approach to teaching majors and non-majors classes (particularly the labs) to a more 'hands-on', project based learning pedagogy, including having students address a hypothesis, gather data and analyze the results to draw proper conclusions.	Long-term		Intended to increase transfer rate. Connecting concepts and skills to actual scientific experiments will provide a deeper understanding of the scientific method and of the major principles and concepts taught in biology courses and thus increase student success.

Section 4: Program Resources and Support

4.1 Using the tables below, summarize your program's unfunded resource requests. Refer to the Operations Planning Committee website: http://foothill.edu/president/operations.php for current guiding principles, rubrics and resource allocation information.

Full Time Faculty and/or Staff Positions

Position	$ Amount	Related Goal (Section 3.2)
FT Faculty/Microbiology	Approx $100,000	Goal 10 With the building of an entirely new microbiology lab, we need a new faculty member to cover the additional courses. Students would benefit from a full time faculty member teaching this rigorous, highly impacted course.
FT Lab Technician	Salary unknown	Goal 10 With the potential to double the sections of microbiology, we need increased lab technician support to do the required preparations for both classrooms. We currently have a single technician in the 5100 building that works only 16 hours a week. With this short amount of time, the technician is just able to complete the necessary preparations for one lab room (6 sections max) of microbiology courses. A full time person would be absolutely crucial to being able to fully use our newly remodeled space in the 5100 building.

Unbudgeted Reassigned Time (calculate by % reassign time x salary/benefits of FT)

Position	$ Amount	Related Goal (Section 3.2)
Department Chair	25% reassignment	Goals 1-9 are aided by the return of funding for our department chair. This position is vital for the continued functioning of the biology department. Without it, we do not have a designated person to handle the design of new or improved courses (including the capstone course in Biology, Biology Honors Course, and interdisciplinary courses). Also, one of our goals is the increased involvement with other departments on campus. This is something that the Department Chair could help facilitate

		through meetings with the other STEM departments, but something that individual faculty members would not have time to do. In addition, help with set-up and running of the open lab space that is crucial for other goals would fall on the Department Chair. Without the return of this position, many of our goals are in jeopardy of not being met. Historically, we have always had (and relied upon) a faculty department chair (with reassigned time). The schedule, organization of new PT hires, and other such department-specific duties are best coordinated with a member of the department working in conjunction with the dean. A stipend is not adequate compensation for these duties.

One-time B Budget Augmentation

Description	$ Amount	Related Goal (Section 3.2)

Ongoing B Budget Augmentation

B Budget FOAP	$ Amount	Related Goal (Section 3.2)
114000141021040100 (Biology)	$20,000/year minimum	<u>Goals 2, 4, 5, 8, 9</u> We need this increase in ongoing funds to support our classes in the department. Without an increase in our B budget, we will be unable to continue to develop new courses, which are necessary to complete many of the goals in 3.2. <u>Goal 10</u> We also need more money to run the added courses that will be taught when the 5100 building is completed and we have new space for an entire second Microbiology laboratory. Running any biology course requires many materials for the laboratory section that are just not supported by our current B Budget

		allocation. Goal 6 Finally, we need this augmentation to continue to offer the high level of instruction we currently do to Biology students discussed in Goal 6. With this continued loss of purchasing power from years of decreases to our already minimal budget, we have already had to remove important reagents from some of the laboratory courses and the students suffer as a result.

Facilities and Equipment

Facilities/Equipment Description	**$ Amount**	**Related Goal (Section 3.2)**
Microscopes for new micro lab (N=25) Incubators for new micro lab (N=2) Refrigerator for new micro lab (N=1) Gel documentation system (N=1)	$100,000	Goal 10 We are building a new lab for microbiology in the 5100 building. Construction begins in W13 and classes will be scheduled in the new labs in F13 (roughly). The room must be outfitted with the proper equipment to teach microbiology.
Tools and instruments for measuring environmental variables. (GPS system, soil chemistry kits, water chemistry meter, heat sensor, electrical usage meter, game cameras, digital camera for dissecting microscope)	$5,000-$10,000 (amount would depend upon quality of equipment purchased)	Goal 6 New equipment is needed to effectively teach some of the new labs/curriculum in ecology/environmental courses.
Clickers Classroom response system	$5,000-$10,000 (amount would depend upon total number purchased)	Goal 6 Clickers are a great way to continue to improve student success in our department. They would allow us to do much more immediate, interactive assessment of student knowledge and adjust our teaching strategies accordingly. This type of active learning is key to the success of students.
Microscopes -dissecting (N=16) -compound light (N=33)	$1700-$2500 each (total amount depends on number purchased)	Goal 6 Each laboratory classroom needs a complete set of functioning microscopes. We have never had a complete set and wish to augment what we do have with

		newer models. The department realizes the quantity of microscopes requested is great and the likelihood of receiving funding for all at once is slim. Therefore, the department has decided that if lesser sums of money are awarded for microscopes, half will be spent on dissecting and half on compound, buying as many as possible, until the full complement of new scopes is realized.
Outdoor classrooms - developed on campus Development of several campus locations for use as outdoor classrooms. These areas would include the open area bounded by the lower campus Biology building and the new counseling and records and admissions building for an evolutionary plant garden. Other areas include the creek and its adjacent banks running through the lower campus, the drainage creek running in front of the new lower campus buildings, the native plant garden as well as several other locations.	$1,000,000 (looking for foundation or grant funding for this)	Goal 11 Project based learning is a good way to enhance student knowledge of concepts and processes in biology as well as deepen their understanding of the scientific method. It will enhance student retention and success and, if done properly, could lead to greater enrollment as the 'word' gets out among students about how we have a dynamic and interesting approach to teaching biology.

Section 5: Program Strengths/Opportunities for Improvement

5.1 Use the matrix provided below and reflect on the program relative to students' needs, briefly analyze the program's strengths and weaknesses and identify opportunities and challenges to the program. Consider external and internal factors, such as demographic, economic, educational, and societal trends. Some considerations may include current and future demand for the program, similar programs at other comparable institutions, and potential auxiliary funding.

	INTERNAL FACTORS	EXTERNAL FACTORS
Strengths	We regularly review our majors courses (Biology 1A, 1B, 1C) to ensure we cover material in an effective sequence. We revise the courses as needed to keep them in alignment with comparable courses at 4-year colleges to which our students transfer.	Because the material we cover in our courses is dictated in part by the CSU and UC schools to which our students transfer, we regularly update our courses. Some schools now require that our students take Biology 1D, making it important for us to offer this class on a regular basis even if the class size is small.
	We have a functional department with faculty who work productively together and who have specialized training in diverse fields within biology.	
	We find creative ways to stretch our resources. For example, we coordinate the use of slides, models and equipment across several classes simultaneously.	
	The department has made an increased effort to identify and use outdoor campus areas in relevant classes. For example, we have worked to improve and maintain the campus native plant garden, and we have explored habitat restoration possibilities along Adobe Creek. Both of these efforts are in collaboration with members of the Horticulture department and with representatives from the local community. We have also begun sampling soil invertebrate communities at various locations throughout campus with plans to develop a long-term ecological survey involving student participants.	Members of the local community take an active interest in the campus outdoor areas, specifically our native plant garden which serves as a demonstration and teaching garden, and any projects along the creek.
	The Sustainable Learning Community at Foothill College is natural fit for many of our faculty and students. We are pleased to have stepped up our participation in this important campus community by incorporating	Mia Casey is the point person for the Sustainable Learning Community and does an excellent job bringing together faculty from diverse backgrounds, and providing faculty with resources. Much of the success of this community depends

	sustainability themes into our courses.	on continued support for Mia's efforts.
Weaknesses	The current lack of a department chair makes it difficult to coordinate department wide tasks (such as completing a program review). For students, part-time instructors, and members of the local community, it is unclear who to contact with questions about our department, or regarding problems. It is more difficult to distribute information to part-time instructors (e.g. policies, lab safety procedures, deadlines) without a designated department chair to perform these functions.	
	The department is often frustrated by the unequal load factors and/or contact hours when comparing equivalent classes between science departments across our district. The disparity has a negative impact on morale and a direct impact on time available for classroom and campus responsibilities.	These issues require solutions beyond the confines of our department.
	Our current online course offerings are limited, though popular. We would like to expand our online offerings for those courses where online instruction is appropriate.	Resolution of the aforementioned issues.
	The department could improve its coordination with other disciplines and with other college initiatives, such as the Science Learning Institute.	Resolution of the aforementioned issues.
Opportunities	The Sustainability Community and the Science Learning Institute are two campus initiatives with which the Biology department can engage to enhance interdisciplinary communication and coordination.	
	The department has successfully held seminar classes through the Foothill College Honors institute. We are exploring ways to increase Biology honors course offerings.	
	The remodel of the 5100 building is an opportunity to make better use of the space and materials we have. It will also allow the department to offer more sections of microbiology, a class with high demand, although this is contingent on funding for necessary	The remodel is funded through Measure (C or E?) money.

	supplies, equipment and staff.	
		Both full-time and part-time faculty in our department continue to receive professional development in active learning strategies through the CCB Fest program at SF State (Community College Biology Faculty Enhancement through Scientific Teaching). The program also fosters collaborative projects between faculty and graduate students, and between faculty across many Bay Area community colleges.
Threats	Our ability to maintain classroom microscopes and to purchase microscopes when needed is always threatened by budget limitations. Our laboratory technician recently received microscope repair and maintenance training that cuts down on our overall maintenance bills. Our ability to increase course offerings, particularly of microbiology, will be limited by available microscopes.	
	Quality of instruction is affected by potential budget cuts that may force students to use fewer materials (e.g. more students per microscope; more students per dissection).	

5.2 Address the concerns or recommendations that were made in prior program review cycles.

N/A.

5.3 What statements of concern have been raised in the course of conducting the program review by faculty, administrators, students, or by any member of the program review team regarding overall program viability?

Regarding overall program viability, there are no immediate concerns. In fact, we feel our program is outstanding, in terms of its productivity, mission, curriculum, faculty, and staff. However, we do feel the program suffers from pressure to offer classes and sections that are not pedagogically sound. We are in complete support of widening our schedule to accommodate students in the best way possible, but we want to stress there are other factors that influence our scheduling decisions that are often overlooked. These include, but are not limited to, laboratory preparation support, maintaining balance to successfully serve our different student populations (general education, transfer, workforce), and attaining and retaining quality adjunct faculty.

5.4 After reviewing the data, what strengths or positive trends would you like to highlight about your program?

The strengths were outlined above - productivity, mission, curriculum, faculty, and staff.

Section 6: Feedback and Follow Up

This section is for the Dean to provide feedback.

6.1 Strengths and successes of the program as evidenced by the data and analysis: The Biology department faculty are dedicated to their disciplines and do an excellent job of educating and counseling students for success. Their productivity numbers are staggering especially considering the hours they spend in laboratory and outside of class tutoring. Due to the high productivity and impacted schedules there is limited time for growth.

6.2 Areas of concern, if any: In order to expand and serve more students in the impacted Microbiology and Biology 1A courses there is a need for an additional biology instructor and an additional full-time laboratory technician to support additional sections. A biology chair would benefit the department and the dean by aiding in scheduling, overseeing ordering, and directing the laboratory technicians in their immediate area. The oversight of ordering materials and directing the laboratory technicians is difficult for the dean to accomplish remotely.

6.3 Recommendations for improvement: The biology department needs space for a dedicated learning center on the lower campus that would serve students by offering instructional support curriculum. There is also a need for full-time biology or microbiology instructor and a full-time laboratory technician to allow for growth in the number of sections offered. A department chair would be a valuable asset to the organization and growth of the biology department. A need is also identified for microscopes to support the newly renovated upper campus 5300 biology building.

6.4 Recommended Next steps:
_x__ Proceed as planned on program review schedule
___ Further review/Out of cycle in-depth review

Section 7: Feedback and Follow Up

This section is for the Vice President to provide feedback.

Good Program Review. Well done!
7.1 Strengths and successes of the program as evidenced by the data and analysis:
The Biology program is clearly a strong program with very dedicated faculty and staff focused on what the students need to learn. The program has a good balance of transfer focus and workforce (support to the CTE programs in the BHS division) focus. The linkage between SLO feedback and resource requests is strong and helps the program keep its focus on asking for what will help students most.
7.2 Areas of concern, if any:
Already addressed by faculty and dean.
7.3 Recommendations for improvement:
As the program continues to grow the limiting factors continue to be: facilities, faculty, staff and equipment. The resource requests in the program review make sense for the program to

improve and grow. Here are some minor notes on the other requests. These notes are not related to work already done by the program and do not suggest work is not being done right now to improve things. These comments are intended to improve and grow an already good program.

Facilities will remain the most limiting factor for the program. Even with the renovation of bldg. 5100, the program will need to explore teaching in some nontraditional times. Demand by students appears high enough to teach earlier or later on weekdays and on weekends. Classes and labs should be offered as soon as possible to begin to serve more students and find out what nontraditional times work best for students.

More faculty will be needed. There is a college approved fulltime position awaiting the new dean's recommendation and awaiting funding decisions at the district and college level. The request for an additional fulltime position corresponds with the expected increase in facilities from bldg. 5100 renovation. There is an immediate need to hire more part-time faculty. These will help increase the course offerings by the department especially during the nontraditional times.

The staff position request would be impacted by the additional classes at nontraditional times. Obviously, adding a large number of these classes means we need more support in the program.

7.4 Recommended Next steps:

__x_ Proceed as planned on program review schedule

___ Further review/Out of cycle in-depth review

Upon completion of section 7, the Program Review should be returned to department faculty and staff for review, then submitted to Instruction and Institutional Research for public posting. See timeline on page 1.

Unit Course Assessment Report - Four Column

Foothill College

Mission Statement: A well-educated population being essential to sustaining and enhancing a democratic society, Foothill College commits itself to providing access to outstanding educational opportunities for all of our students. Whether through basic skills, career preparation, lifelong learning, or transfer, the members of the Foothill College community are dedicated to the achievement of learning and to the success of our students. We affirm that our unwavering dedication to this mission is critical to the prosperity of our community, our state, our nation, and the global community to which all people are members.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 10 - GENERAL BIOLOGY: BASIC PRINCIPLES - SLO 1 - Scientific Process - Explain the scientific method and demonstrate an ability to use this method of study. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded questions on final and lab quizzes. **Assessment Method Type:** Exam - Course Test/Quiz	05/24/2012 - results section - report students did/did not ..... just the data **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** what could help students meet target - student success **GE/IL-SLO Reflection:** reflect on islo students met this by ..... failed to demo, so should change .....INSTITUTIONAL LEVEL	05/24/2012 - COURSE LEVEL - great job no change, oops failed try this next
		12/15/2011 - Submitted by Lisa Schultheis: Assessments in the lab portion of the course that address this SLO are: 1. Scientific Method lab in which students conduct and report on a simple experiment. Average score = 95% 2. Lab Quiz in which students analyze a Science Daily news item, identify hypotheses and variables. Average score = 80% 3. Osmosis lab in which students conduct an experiment, analyze results and prepare graphs. Average score = 92% 4. Lab Quiz including questions in which students analyze experimental design and results similar to those seen in their Osmosis lab. Average score = 76% 5. Plant lab in which students conduct an experiment on photosynthesis. Average score= not relevant (participation, not graded) 6. Lab Quiz including questions based on the	12/15/2011 - Submitted by Lisa Schultheis: My overall impression is that the students need more practice with assessing what a particular experiment is designed to test, and with analyzing experimental results. Two possible ways to approach this are: 1. Include more questions on lab and lecture exams that specifically address these topics 2. Include more experiments in the labs, and require students to write up the results in the form of a report more frequently (individually or in groups). Many of the labs already include experiments and could include more formal reports. Others could be modified slightly to have a

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Plant lab experiment. Average score = 75%. 7. An assignment in which students read material on the ?Understanding Science? website and answer questions. The assignment covers the scientific method, ways in which it is oversimplified, scientific conduct, and methods scientists use to avoid bias in their investigations. Average score = 85% Assessments in the lecture portion of the course are: 1. Quiz and exam questions about the attributes of science and types of reasoning (inductive versus deductive). The questions from one exam to the next were not the same, but covered the same general topic. Exam % missing the question % missing the question % missing the question Quiz 1 43 16 Exam 1 24 34 45 Final 10 5 2. Quiz and exam questions in which students had to evaluate an experimental design and/or identify experimental variables. The questions from one exam to the next were not the same, but covered the same general topic. Exam % missing the question % missing the question % missing the question % missing the question % missing the question Quiz 1 20 28 93 70 Exam 1 2 22 50 58 16 Exam 2 19 Final 16 Student scores were high for lab activities, but were much less on lab quizzes where they had to analyze experimental design and experimental results. Student performance on lecture quiz and exam questions was very low, but improved as the quarter progressed. **Result:**	more experimental approach. Work with instructors who teach this course to identify the labs that are easiest to modify. (Submitted by Lisa Schultheis).

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Target Not Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 10 - GENERAL BIOLOGY: BASIC PRINCIPLES - SLO 2 - Disease Prevention - Describe the risk factors and methods of prevention for cardiovascular disease and cancer. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** List 5 characteristics of cells - first week of quarter. Revise list - end of quarter. **Assessment Method Type:** Essay/Journal **Target:** 85% of the students will show improved use of vocabulary, depth of response in the "after" list when compared with the "before" list.		
	Assessment Method: Embedded questions on final **Assessment Method Type:** Exam - Course Test/Quiz	12/15/2011 - Submitted by Lisa Schultheis: Assessments in the lab portion of the course that address this SLO are: 1. An assignment in the Nutrition lab in which students must identify foods that are beneficial and harmful with regard to cardiovascular disease and cancer. Average score = 98%. Assessments in the lecture portion of the course that address this SLO are: 1. A set of exam questions in which students identify beneficial foods, or identify what risk factors may or may not be present based on a hypothetical diet. % of students answering the questions incorrectly: 20, 29, 3, 10. A question on the final addressing this SLO yielded 46% of students answering incorrectly. Students did well on the lab activity/assignment for this SLO, but did not perform as well when applying the information in lecture exams. Instructors in other quarters spend much more time on this topic and assign more activities to give students practice. I do not have the data but would guess that students have higher scores during those quarters. **Result:**	12/15/2011 - Submitted by Lisa Schultheis: My suggestion is to replace this SLO with one that is more applicable to general biology. An SLO about the cellular basis of life or about evolution would, in my opinion, be more appropriate. This is not to take away from the importance of the current SLO, but the importance instructors place on this topic will vary widely with respect to a general biology class. This SLO is better placed as a course objective, in my opinion. Work with instructors who teach this course to see if others agree that this SLO should be changed. If the consensus is no, then leave it as is. If the consensus is yes, then revise SLO#2. I only have data from Fall 2010; those instructors who commented on the SLO reflection also suggested that an SLO addressing evolution or genetics would be more appropriate. ((Submitted by Lisa Schultheis).

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 12 - HUMAN GENETICS - SLO 1 - Patterns of Inheritance - Demonstrate an ability to use Mendelian principles to predict genetic inheritance. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam question **Assessment Method Type:** Exam - Course Test/Quiz	07/02/2012 - Of the four tru-false questions about Mendel's monohybrid cross: 88% could recognize the gametes produced by the parents; 100% new that the F2 would display two different phenotypes; 91 % kenw that one quarter of the F2 would be true-breeding for the dominant trait; 94% could predict the genotypic ratio resulting in the F2. Students also showed good understanding on the experimental process used by Mendel in that 66% accurately answered a multiple choice question about why he chose to use Pisum sativum as a model system. 80% of students were able to match Mendel's laws with descriptions of each. The overall score on the exam was 76%. **Result:** Target Met **Reporting Year:** 2011-2012	
	Assessment Method: homework assignment.		
Department - Biological Sciences (BIOL) - BIOL 12 - HUMAN GENETICS - SLO 2 - DNA Fingerprint - Demonstrate an ability to interpret a DNA fingerprint. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam question. **Assessment Method Type:** Exam - Course Test/Quiz		
Department - Biological Sciences (BIOL) - BIOL 13 - MARINE BIOLOGY - SLO 1 - Evolution - The student can describe the	**Assessment Method:** Question embedded in the final exam. **Assessment Method Type:**	12/11/2011 - Students were evaluated with 3 multiple choice questions on the final exam and one short answer essay question on the second	12/11/2011 - I have changed my lecture slides, to further elaborate

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
theory of evolution. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	Exam - Course Test/Quiz	midterm exam. Of the multiple choice questions, approximately 60% of the students answered them correctly. Of the short answer questions, only 20% of the students received full credit for their responses. Students are having trouble thoroughly describing in detail the theory of natural selection. **Result:** Target Met **Reporting Year:** 2010-2011	on the ideas behind natural selection and have included a short answer question on a quiz. I have eliminated some of the detail from my lecture that may be too advanced for this level class.
Department - Biological Sciences (BIOL) - BIOL 13 - MARINE BIOLOGY - SLO 2 - Global/Community Conciousness - The student can make well informed decisions as a consumer based on their understanding of sustainable fishing practices and evaluate how their own behavior affects future fish conservation. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Question embedded in exam. **Assessment Method Type:** Exam - Course Test/Quiz	12/11/2011 - The students definitely seemed to grasp the concept of consumer demand and its effect on over fishing. 27% of the students received above a 90% on their assignments, 54% received above 75% of the the total points given. However, these grades correspond mostly to the way the students presented their quantitative data and not on their basic understanding of the concepts. I believe the point totals would have been higher, if they had a better grasp on how to analyze and present quantitative data. **Result:** Target Met **Reporting Year:** 2010-2011	12/11/2011 - I will spend more lab time explaining how to use Microsoft Excel, and how to graph data that they have collected. Give more examples during lab.
Department - Biological Sciences (BIOL) - BIOL 13 - MARINE BIOLOGY - SLO 3 - Scientific Process - The student can understand how to collect scientific data quantitatively and present those data graphically. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Question embedded in final lab assignment. **Assessment Method Type:** Class/Lab Project	12/11/2011 - Students were able to collect data appropriately however they had trouble analyzing the data and clearly representing the data graphically. **Result:** Target Met **Reporting Year:** 2010-2011	12/11/2011 - I love this assignment, however, the students need more guidance as to how to analyze quantitative data. I will review methods in lab.
Department - Biological Sciences (BIOL) -			

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
BIOL 14 - HUMAN BIOLOGY - SLO 1 - Evolution - The student will be able to describe the theory of evolution by natural selection and explain how it unifies all living things at least three different levels of the biological hierarchy. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Each lecture exam (there are three total) will have questions asking students to related the unity and diversity of life as explained by evolutionary theory at the levels of the biological hierarchy that are relevant to the information covered on that exam. For example: on the first exam, the students are asked to discuss the how all living things are unified and differentiated at the molecular and cellular levels and how this demonstrates descent with modification by natural selection. Assessment consists of tracking number of points earned out of total possible points (8 pts) for the question. **Assessment Method Type:** Exam - Course Test/Quiz	01/20/2012 - See related document **Result:** Target Met **Reporting Year:** 2011-2012 **Related Documents:** Fall 2011 Bio 14 Reflections	
		12/11/2011 - Approximately 1/4 of the students could accurately and completely recognize unity and diversity at the molecular level. Approx. 1/2 of the students were somewhat able to complete the task. Overall, students have a hard time tying together evolutionary processes and how this is exemplified by similarities and differences in traits of organisms. **Result:** Target Met **Reporting Year:** 2010-2011	12/11/2011 - Be as explicit as possible with examples of how they illustrate evolution. Winter 2011- began emphasizing during lecture where related information was and that it was related to SLO. F 2010. I will probably move this to the end of the course, change it to a short paper assignment that asks them to summarize evidence at every level of the hierarchy discussed in class. Winter 2011. use a pre-test at the beginning of the quarter in Fall.
Department - Biological Sciences (BIOL) - BIOL 14 - HUMAN BIOLOGY - SLO 2 - Scientific Process - The student will be able to evaluate basic scientific research as described in the popular press and explain the study in terms of the scientific method. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** The students will be assessed on each exam with questions related to processing the scientific method. For example, on the first exam, the students are asked to visit the website www.sciencedaily.com or similar reference and to choose a study to evaluate. They are asked to identify the question(s) asked, the hypothesis of the research, the independent, dependent and controlled variables and to discuss whether or not the researchers supported or falsified their hypothesis and to explain their answers. I track the number of correct answers based on points earned (out of 8 points on the first and last exams.)	01/20/2012 - See related document **Result:** Target Met **Reporting Year:** 2011-2012 **Related Documents:** Fall 2011 Bio 14 Reflections	
		05/12/2011 - Most of the students are able to accurately interpret the experiments in the article and articulate the conclusions of the research. I would say that about half of the students still have some difficulty discerning between the independent, dependent and controlled variables. **Result:** Target Met **Reporting Year:**	12/11/2011 - I will provide one extra homework assignment that asks them to practice the process prior to having it on an exam. I did add a web activity to visit a website to deeply investigate the process of science but I need to find a way to integrate it more thoroughly into the course during lecture/exams.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Assessment Method Type: Exam - Course Test/Quiz	2010-2011	Winter 2011 - may add a new assignment in the Fall to have them evaluate health claims on food and/or health products and to examine the scientific research that the claims are based upon for validity. Winter 2011 - Added additional assessment on final exam. Changes were not notable between findings at the beginning of the quarter and the end of the quarter. Indicates that students need many examples and opportunities.
Department - Biological Sciences (BIOL) - BIOL 15 - CALIFORNIA ECOLOGY/NATURAL HISTORY - SLO 1 - Scientific Process - The student will master basic techniques of field biology, including taking field notes, identifying organisms in the field, and using survey and sampling techniques. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** The student will be required to enter at least 7 entries into a field journal (Modified from John McLaughlin, Western Washington University) Here is the assignment: For an ecologist or field biologist, the field notebook is a record of their observations and the conditions of their study sites. One emphasis of this course is to learn basic field techniques, your field notebooks will be one of your most important tools. You should record all of your observations, hypotheses about natural history patterns, and other ideas related to natural history in your notebooks. Your notebook should contain entries from each field trip in the course, supplemented by natural history observations you make outside of the course. (You might want to carry your	08/27/2012 - Overall, students were able to do this project. **Result:** Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** This assignment asks the students to communicate, through written means, their impressions, interpretation and understanding of the various ecosystems that we visit over the course of the quarter. Overall, the students are able to do this. There still seems to be a problem in understanding the level of detail that students should include in the field notebooks - with some students doing an outstanding job and others merely reporting without interpretation.	08/27/2012 - Because very specific directions are handed out at the beginning of the quarter, 90% of the students are able to at least include the basic report requirements that are listed. There seems to be a break in the ability to tie together and interpret the information that they gather into meaningful field notes. Many of the students simply write down what they see as lists rather than making notes about their observations. For example, they will state that plant A is present, but they will not note what its status is (e.g. flowering, fruiting). There also seems to be a tendency to blend together ecosystems at each field site (there are multiple ecosystems at each field site). For example when we visit Henry Coe State Park, they see oak savanna,

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	notebook with you at all times this quarter. Perhaps you will enjoy natural history so much that this will become a life-long habit). There is a great book about keeping a field journal: Keeping a Nature Journal by Clare Walker Leslie and Charles E. Roth (2000) that might be useful. **Assessment Method Type:** Essay/Journal **Target:** 90% of students should be able to do this with a B or better. **Related Documents:** Rubric/Criteria for Field Notebook Biology 15		chaparral, grassland and mixed oak forest but the students tend to meld these into one ecosystem called Henry Coe, rather than recognizing them as distinct but related components. In the future, I am going to try to emphasize that they should look for differences and similarities (structure, composition and function) between the systems so that they can recognize both the interrelatedness and the distinctions between the different systems. I will do this by rewriting the assignment, providing prompts in the field trips and requiring weekly "reflections" on their field trip experiences so that I can modify their behaviors earlier in the quarter.
		12/11/2011 - Two things: provide a "good" example of a field notebook (a 2009 student has agreed to let me copy his notebook) and spend part of a lab or lecture specifically and explicitly instructing the entire class on how to keep the notebook in a hands on activity (instead of just hoping that they are listening when I read it aloud to them). Spring 2010. Students were provided with two examples of field notebooks that were excellent from former students (with their permission). These were available at all times on the course management site. A number of students picked and chose those aspects that they liked from the examples but still did not really fulfill the full set of requirements as described in the handout. I should probably collect the notebooks after the first field trip to provide earlier feedback. I would like to see growth as the quarter progresses. **Result:**	12/11/2011 - I will make sure to more explicitly provide information and background to the students about sites that indicates that they are representative of communities rather than being the only example of those communities. Students were provided with summary handouts for each field trip describing major geologic and natural features, animals, plants etc... I think that perhaps more details should be included in future handouts to help prompt them. We used a new textbook this quarter and as it is shorter and more concise, I think it helped but I need to continue to develop ancillary materials to help the students make the connections.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Target Met **Reporting Year:** 2010-2011 **Resource Request:** More field guides, sampling equipment including GPS, plant presses, binoculars, environmental sampling machines.	
		10/12/2011 - Most students do an adequate job of describing each field site withtheir own field notes. However, many do not really understand the idea that they need to be a bit more quantitative in their descriptions in explaining the relative abundance and frequencies of the different species and that their descriptions should be based only on their observations and not external research. **Result:** Target Met **Reporting Year:** 2010-2011 **Resource Request:** Field guides that will help in identification. Environmental conditions loggers will help to gain a better understanding of light, temperature, wind and other environmental variables. Better binoculars will also aid in improved field observation.	10/12/2011 - I think that I should maybe go in depth step by step on the first field trip to really demonstrate what they need to be looking for. Also providing them ahead of time with lists of EXPECTED organisms so that they can spend more time observing and noting and less trying to write down the spellings of organisms when we are out in the field.
Department - Biological Sciences (BIOL) - BIOL 15 - CALIFORNIA ECOLOGY/NATURAL HISTORY - SLO 2 - Ecological Principles - The student will explain basic principles of organismal, population, community and ecology (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** The student will use the information gathered in their field journal to write a natural history report describing the ecology of an ecosystem visited during the course. Natural History Report #2 Select a distinct ecological community that we have visited in the San Francisco Bay Area. For this assignment please make your observations within the ?interior? of the	08/27/2012 - The majority of students are able to adequately complete a report with a score of 80% or higher. **Result:** Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** This SLO meets the communication and critical thinking learning outcomes. Students can clearly write the reports and communicate their understanding but there seems to be a muddling of ecological	08/27/2012 - In this project, students are asked to select one ecosystem that they visited and write a report on it primarily based upon their observations. Students are able to do so but with a number of problems - first they seem to confuse a park with an ecosystem. When we visit different field sites, they are usually comprised of multiple ecosystems and the students do not seem to recognize

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	community (avoid edge habitats). Observe the community and answer the following questions. Feel free to support your written answers with drawings, photographs, or non-living, non-toxic, non-infectious samples. Your report need not exceed 2-3 pages in length (single-spaced). Please list references at the end of your report. **Assessment Method Type:** Case Study/Analysis **Target:** 90% of students will complete the report with a grade of B or higher. **Related Documents:** Rubric/Criteria for Natural History Report 2Biology 15	concepts specific to their reports. While they meet the communication LO adequately, they still need to improve their ability to apply and synthesize collected data to their reports.	that so their reports are sort of jumbled messes comprised of descriptions of multiple systems rather than just one. To try and clarify this I have a several pronged approach: 1. increase and emphasize major ecological concepts (such as flow of energy and matter, species composition) over the entire quarter in quizzes and at field sites; 2. Because they are supposed to use their field notebooks for the majority of their data in their reports, spend more time making sure that they are adequately distinguishing between the ecosystems that we visit at each field site.
		10/12/2011 - Student do a good job of basic descriptions but they do not really get that they need to be more detailed and that these details should come from their own observations (not outside sources) for the basic descriptions. They also have a hard time understanding that they need to then relate their observations to outside information by doing some research. **Result:** Target Not Met **Reporting Year:** 2010-2011	10/12/2011 - For the future, I think I will maybe have the students do a practice version based upon one of the first field trips. Then I will critique those to help them better understand why accurate reporting/descriptions are so important and how to better observe and record what they see. I will also be requiring them to do some more homework on nutrient cycling and other basic ecological principles so that they can gain a better understanding of these processes so that they can apply them to the real world. A challenge is that because they can choose any ecosystem we visit, they often do not really know what they want to cover for their reports until the end of the quarter. I am not sure how to

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			solve this - maybe not allowing the systems visited on the last two field trips to be used for the report.
Department - Biological Sciences (BIOL) - BIOL 17 - BIOTECHNOLOGY & SOCIETY - SLO 1 - Application of Biotechnology - Students can give specific examples of biotechnology-related products or applications. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 17 - BIOTECHNOLOGY & SOCIETY - SLO 2 - Personal Relevance of Biotechnology - Students can relate biotechnology-related products or applications to their daily lives (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 17 - BIOTECHNOLOGY & SOCIETY - SLO 3 - Evaluate Biotechnology information - Students can evaluate information about biotechnology-related products or applications. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 190X - DIRECTED STUDY - SLO 1 - Demonstrate Understanding - Student can demonstrate an understanding of a major concept discussed in class. (Created By			

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 190X - DIRECTED STUDY - SLO 2 - Communication - Student can communicate understanding of a major concept discussed in class. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 1 - Cellular level of life - Students can describe life at the cellular level. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** List 5 characteristics of cells. **Assessment Method Type:** Pre/Post Test **Target:** The post-test answers should demonstrate increased comprehension, as evidenced by use of appropriate (and new) vocabulary and higher-level knowledge. All students should show an improvement.	10/21/2011 - In winter 2011, 40 students were given a pre-test and post-test on the characteristics of cells. From the results of the pre-test, it was clear that the students were already prepared with a general concept of cellular characteristics. Because this assessment was not part of their overall grade, I did ask that they take seriously the post-test part, so I could evaluate if their understanding of cells had improved. All of the students showed some level of improvement, most using the new vocabulary in appropriate ways. **Result:** Target Met **Reporting Year:** 2010-2011	10/21/2011 - In retrospect, I don't think this assessment method matches the CL-SLO as closely as I'd hoped. I need to rethink how to better evaluate if a student has progressed in their knowledge of cells and life at the cellular level. I might even consider changing the CL-SLO in light of the new PL-SLOs for Biology.
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 2 - Compare prokaryotes and eukaryotes - Students can compare and contrast prokaryotic and eukaryotic life. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Compare/contrast questions on the final exam. Questions are not restricted to structures, but include all life processes. **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 85% correct.	06/28/2012 - Spring quarter 2012 - 21 final exam questions. 8/21 questions missed more than 25% of the time. 6/21 questions missed 16-24% of the time. Zero questions missed 10-15% of the time. 7/21 questions missed less than 10% of the time. This quarter, the type of questions missed were almost the same as those in winter quarter. 67% of the questions were missed by more than 15% of the students. Winter quarter 2012 - 20 final exam questions. 8/20 questions missed more than 25% of the time. 5/20 questions missed 16-24% of the	05/05/2012 - I've been keeping track of student progress on these questions for several years, now. I have implemented many changes to my class - including: mandatory lecture attendance with daily class activities designed to have student think critically about what they have learned and apply it across the levels of life, mandatory online homework, and written exam

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		time. 6/20 questions missed 10-15% of the time. This quarter the type of questions missed were fairly random - some structure and some process comparisons were included in the "frequently missed" category. 95% of the questions were missed by more than 15% of the students. Fall quarter 2011 - 28 final exam questions. 10/28 questions missed more than 25% of the time. 1/28 questions missed 16-24% of the time. 4/28 questions missed 10-15% of the time. This quarter process comparisons were missed more often than structure comparisons. 53% of the questions were missed by more than 15% of the students. **Result:** Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** More institutional support - tutors, open labs, etc...	questions. Quarter to quarter there is variability in how the class does on these questions. Fall quarter classes tend to perform best. I honestly think students need to start taking control and responsibility for their learning. There is only so much an instructor can do - we can lead them to water but cannot make them drink. I will continue to do what I think is necessary - practice with "thinking" about course content, but it is now their turn to step up.
		10/22/2011 - Winter and spring quarters 2011 - 25 final exam questions. 9/25 questions missed more than 25% of the time. 4/25 (avg) questions missed 16-24% of the time. 3.5/25 (avg) questions missed 10-15% of the time. Students are getting better with structure comparisons but still struggle with processes. 50% of the questions still being missed by more than 15% of the students. **Result:** Target Not Met **Reporting Year:** 2010-2011 **Resource Request:** Open lab/tutoring facilities dedicated to Biology students and available daily.	
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 3 - Scientific Process - experiment - Students can pose questions, state hypotheses, and identify variables from any	**Assessment Method:** Students are given an abstract or other article summarized from an original research publication. After reading the selection, they will rephrase the question in a "How does	05/25/2012 - Fall 2011 - average 84% Winter 2012 - average 77% Spring 2012 - average 73% Average over 3 quarters - 78%	05/25/2012 - Some quarters are better than others. Assignment prompt has not changed but there is a spread of grades over the year.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
given experiment. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	____ affect ____?" format, identify the independent and dependent variables from the question, and state the hypothesis in an "If ... then ..." format. **Assessment Method Type:** Case Study/Analysis **Target:** Average 75% on assignment.	**Result:** Target Met **Reporting Year:** 2011-2012	My "hypothesis" is that fall students are more prepared than spring students - let's see if this is a trend...
		10/22/2011 - Fall 2010 - average 85% Winter 2011 - average 71% Spring 2011 - average 80% Average over 3 quarters - 78.7% **Result:** Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 4 - Scientific Process - graphs - Students can graph experimental results. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will make a graph of their experimental data from any appropriate lab activity. **Assessment Method Type:** Class/Lab Project **Target:** Average 80% on assignment.	06/28/2012 - Spring 2012: interesting ... students were given the same "How to Make a Graph" handout as in winter 2012 and the grades went from 93% on the first graph to 80% on the last graph! **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** More institutional support - tutors, open labs, etc...	
		05/25/2012 - In winter 2012, students were given a formal handout on "how to make a graph" and the graphing exercises in the lab were assessed using these specific guidelines. Class average for the first graph was 80%. Class average for the last graph was 91%. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** none	
		10/22/2011 - Students are expected to improve their graphing skills over the quarter. Two graphs	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		are used to assess improvement. Fall 2010 - 80% graph 1 to 82% graph 2 Winter 2011 - 71% graph 1 to 84% graph 2 Spring 2011 - 72% graph 1 to 74% graph 2 All quarters showed improvement, but target was not met in spring 2011. **Result:** Target Met **Reporting Year:** 2010-2011	10/22/2011 - Students generally do better on graphs when they have to do them manually, rather than by computer. We changed the assignment "rules" this year and, in general, students did a better job on their graphs. There is quarter-to-quarter variation, as seen here.
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 5 - Scientific Process - conclusion - Students can analyze experimental results to draw a conclusion. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be given a graph or table of experimental results and asked to write a conclusion based on the data. **Assessment Method Type:** Class/Lab Project **Target:** Average 80% on assignment.		
	Assessment Method: Students can distinguish between results and conclusions from their own, or other published, data. **Assessment Method Type:** Class/Lab Project **Target:** Average 80% on assignment.	06/28/2012 - Winter quarter 2012, students were given several examples of experimental outcomes. On average, at the end of the quarter, 33% of the class is still confusing a result statement with a conclusion statement. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** More institutional support - tutors, open labs, etc...	06/28/2012 - Over the past few years, I have attempted to break the scientific method into small, digestible parts and to foster student learning of each part with practice assignments asking for identification and proper phrasing of hypotheses, variables, controls, etc... The most difficult components to master have been proper phrasing for hypotheses and distinguishing between results and conclusions. Currently, there are at least 7 different laboratory exercises where students are expected to draw their conclusions directly from their experimental results. Generally, students do well on these exercises. However, when given results from a publication, they revert to their "pre-class" knowledge and continue to

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			confuse the results as conclusions. I have been in conversation with the other biology instructors to alert them to this, so they can continue to refine the students' abilities as they progress through the biology year.
Department - Biological Sciences (BIOL) - BIOL 1B - FORM & FUNCTION IN PLANTS & ANIMALS - SLO 1 - Physiological Processes - The student will compare and contrast the functioning of physiological systems in plants and animals. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** During the quarter students will answer exam questions testing their knowledge of plant (growth, development, reproduction, water and nutrient transport, hormones, responses to external environmental cues) or animal (nervous, muscle contraction, digestive, circulatory, respiratory, excretory, reproduction, development) systems. Questions assessing their ability to compare and contrast animals and plants will appear on a cumulative final exam as multiple choice and/or essay questions. These could include questions addressing the determinate versus indeterminate growth of animals versus plants, differences in development due to cell walls in plants, the role of pressure gradients in both animal and plant transport, and similarities and differences in gametogenesis. Multiple choice questions are typically worth 2-3 points, and essays 5-10 points. **Target:** 80% of students will answer questions correctly (if multiple choice) or receive passing scores (if written responses).	07/06/2012 - 84% of the students answered the first comparative question on the final correctly. Only 79% answered the second comparative question correctly. This is an improvement over past quarters, but should be even higher. I plan to incorporate a more explicit plant/animal comparative approach throughout the quarter. **Result:** Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** Continued access to materials for growing plants and to animal dissection materials not to exceed four students per item to be dissected.	
		12/11/2011 - The last two questions on the final exam specifically addressed this SLO. Only 60% of the students answered the first question correctly. 84% of the students answered the second question correctly. Winter 2011 update: The numbers this quarter were similar to improved. 67% answered the first question correctly. 85% answered the second question correctly. **Result:** Target Met **Reporting Year:** 2010-2011	12/11/2011 - Winter 2011 update: Due to the holiday schedule, we have one less lab in winter than spring. During spring we are able to do a water potential lab, which should improve student understanding of turgor pressure in plant cells. The number of lectures varies from quarter to quarter with the holiday schedule. When time allows, I would like to develop a comprehensive activity for the last day of class in which students draw on the entire

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			quarter to compare and contrast specific systems in plant versus animal function. The high % of incorrect answers to the first question seems to be because students did not sufficiently understand the role of the cell wall in allowing plants to have cell turgor pressure, and the inability of animal cells to have positive internal pressure. I will need to present this more explicitly during class. Winter 2011 update: I did present the material more explicitly this quarter, which may account for the increase in correct student responses.
Department - Biological Sciences (BIOL) - BIOL 1B - FORM & FUNCTION IN PLANTS & ANIMALS - SLO 2 - Scientific Process - Students will be able to communicate the results of scientific research to an audience of peers. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students discuss topics to research for a multi-week laboratory experiment. In groups of 3 or 4 students, they decide which specific hypotheses they will test, and then design and carry-out an appropriate experiment. Each group reports their results in a 15 minute oral-presentation following a format typical of scientific meetings. Individuals write papers in the format of a typical scientific paper and submit them for peer-review by their classmates. Using feedback from the peer-review process, group members prepare a written group report graded by the instructor. Points are awarded based on the quality of presentations, participation in the peer-review process, the outcome of the peer-review process, and the quality of the group paper.	07/06/2012 - As in past quarters, students showed dramatic improvement from their initial introductions (average score = 73%) to the final group paper (average score = 90%). **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** This is a valuable multi-week project that requires consumables (fresh seeds, soil) and access to growth racks and occassionally the greenhouse. The success of this project also relies on access to primary literature found through the library. **GE/IL-SLO Reflection:** This SLO relates directly to "Communication" and to "Creative, Critical, and Analytical Thinking". Students engage in a standard form of scientific	07/06/2012 - The peer review process is not perfect in that the quality of student feedback is variable, but it provides fast feedback and an opportunity for students to improve their work based on this feedback. In the future I want to try incorporating an exercise in which the class grades a sample paper together, so that students have an example of constructive feedback. I also want to find a way to efficiently grade the students on the quality of the peer-reviews they conduct.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	Assessment Method Type: Research Paper **Target:** 80% of students receive a passing score on the research paper.	communication (a scientific research paper), and must exercise critical thinking when designing their experiments and interpretting results. 12/11/2011 - Students did an excellent job on their presentations (92% average). They improved dramatically from the written report introductions to the complete reports (77% average on the former; 89% on the latter). **Result:** Target Met **Reporting Year:** 2010-2011	
	Assessment Method: Students discuss topics to research for a multi-week laboratory experiment. In groups of 3 or 4 students, they decide which specific hypotheses they will test, and then design and carry-out an appropriate experiment. Each group reports their results in a 15 minute oral-presentation following a format typical of scientific meetings. Individuals write papers in the format of a typical scientific paper and submit them for peer-review by their classmates. Using feedback from the peer-review process, group members prepare a written group report graded by the instructor. Points are awarded based on the quality of presentations, participation in the peer-review process, the outcome of the peer-review process, and the quality of the group paper. **Assessment Method Type:** Presentation/Performance **Target:** 80% of groups receive passing grades on presentations.	07/06/2012 - Students consistently do well on the group presentations. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** Successful implementation of this project requires continued access to a room with document cameras and projectors. **GE/IL-SLO Reflection:** Just as with the written research paper, doing a 15 minute presentation is standard format for communicating research results in this field, and fits with the "Communication" category. Preparing the presentation requires students to think critically about how to interpret and present their results, and fits the "Creative, Critical and Analytical Thinking" category.	07/06/2012 - This is an exercise worth keeping. It would be more equitable if I could find lab time for students to use when preparing their presentations so that they are not restricted by their schedules outside of class time. I may be able to allot some time for this during the Mineral Nutrition lab.
Department - Biological Sciences (BIOL) - BIOL 1C - EVOLUTION, SYSTEMATICS &	**Assessment Method:** The student will be asked to choose an		

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
ECOLOGY - SLO 1 - Ecosystem Processes - Students will be able to describe an ecosystem in terms of the flow of energy and cycling of matter between the abiotic to the biotic components of that ecosystem. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	ecosystem and describe it for two parameters: energy and matter 1) in terms of the flow of energy from the sun through the trophic levels. A good answer will include a discussion of primary productivity, secondary productivity, the inefficiency of energy transfer through the ecosystem and why the inefficiency limits length of food webs and the population size of the higher trophic levels. 2) In addition the student will discuss at least two biogeochemical cycles between the biotic and abiotic components of the ecosystem. For example, if they choose the nitrogen cycle, they must discuss which members of the ecosystem are responsible for making it biologically available, how it moves into the autotrophs and then into the heterotrophs, the role of the decomposers in cycling and finally why the nitrogen is important for living things and why it is often considered a limiting factor in ecosystems. Other biogeochemical cycles they can choose are the hydrologic cycle, the carbon cycle or the phosphorus cycle. **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of students will answer the test question correctly (if multiple choice) and/or will receive a passing score (if a written response).		
Department - Biological Sciences (BIOL) - BIOL 1C - EVOLUTION, SYSTEMATICS & ECOLOGY - SLO 2 - Evolution - Students will explain natural selection of populations under different selective pressures. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:**	**Assessment Method:** Students will conduct an experiment that examines the loss of antibiotic resistance (carried on a plasmid) in environments with or without the antibiotic (which is the selective pressure). The students are required to turn in a written report with their hypotheses, predictions, results and	06/14/2012 - While 100% of the students score about 75% on the assignment there are a few places where they stumble. Students often misinterpret the ongoing process of natural selection with determining when evolution has occurred. **Result:**	06/14/2012 - About 20% of the students misinterpret the maintenance of a trait as evolution. While natural selection is actively maintaining the trait, that maintenance is not evolution occurring- they either fail to state or

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active	conclusions including a explanation of why adaptations might be favored or selected against under different environmental conditions. **Assessment Method Type:** Essay/Journal **Target:** 80% students receive a passing grade on the written report.	Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** Students are able to communicate, in written form the process of science and the process of evolution over time.	understand that evolution is change over time in the genetic make-up of the population. While it is not evident as a misconception in a large proportion of the class, it is a major misconception. I may try to incorporate information at the start of the 5 week experiment to get them to think about the number of potential generations that will occur so that they can recognize that observed changes are not in a single organism but over time instead and that when they do observe the outcome of the genetic changes, they should interpret that as evolution due to a change in the environment driving natural selection.
		01/21/2012 - In Fall 2011 students did an excellent job writing their reports (96%) and demonstrated a clear understanding of natural selection as it related to the experiment. **Result:** Target Met **Reporting Year:** 2011-2012	
		12/11/2011 - Students cultured antibiotic resistant bacteria in environments with and without antibiotics, and then assessed whether cultures evolved with respect to resistance. Students score well on the assignment. Most of them are able to explain which culture tubes did and did not evolve, and to explain the selective pressures associated with different culture conditions. **Result:** Target Met **Reporting Year:**	12/11/2011 - Adding questions about the use of the control plates. Not all of the students understood how to use these plates in describing data trends.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		2010-2011	
Department - Biological Sciences (BIOL) - BIOL 1C - EVOLUTION, SYSTEMATICS & ECOLOGY - SLO 3 - Phylogeny - Students will explain the phylogenetic relationships of all living things in terms of derived and ancestral traits. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be required to carry out a quarter long project in which they collect representatives of 10-12 phyla profiled in the course. In approximately week 8, the students will bring in their collections for presentation to the class. The class will discuss the different phyla collected and their characteristics. Each student will then pick three organisms from one phylum that were collected by the class and describe the common features of these organisms (body plan, habitat, etc.)as well as the differences between them. Because the students are required to memorize the characteristics of about 35-40 phyla in the course, this exercise will also serve to help them make associations to these groups. **Assessment Method Type:** Class/Lab Project **Target:** 80% of student groups receive a passing grade on the collection. 80% of individual students receive a passing grade on the phylum essay.	01/21/2012 - During Fall 2011 the class average on the project was a 98%. They also had high scores on the individual assessments of phylogenetic relationships (92%), and on their phylum essay (96%). The project is a highly effective means for students to learn phyla and connect the information to the world around them. In a pre versus post assessment (beginning and end of quarter) of the diversity of plant and animal phyla that students knew, scores doubled (average # of distinct phyla listed for plants: 2.2 pre, 4.2 post; for animals 2.2 pre, 4.4 post). This is consistent with past quarters. This quarter I provided more specific requirements regarding how to identify a specimen. The effort each group put into the project seemed more equal as a result. The project will be even more effective with additional practice keying and identifying unknown organisms. Mosses (bryophytes) are abundant and easy to store, and could be used to practice these skills. We should get a good bryology field guide covering Northern California. One possibility is the treatment of San Francisco bryophytes found in a recent special issue of Madrono. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** A bryology field guide (if not already available in the library). 12/11/2011 - Students were able to demonstrate a measurable improvement in their knowledge and	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		recognition of organismal diversity and its organization as illustrated by surveys at the start and end of the quarter; as indicated by a doubling in recognition of animal and plant phyla. Students were also able to demonstrate an understanding of the evolutionary relationships at the family level of the taxonomic hierarchy between collections as demonstrated in their phylogenetic tree constructions. **Result:** Target Met **Reporting Year:** 2010-2011 **Resource Request:** Microscopes and field guides for id. Biology 1C lab classroom has less than 12 working (and not very well) microscopes for a class with 32 students. This is a major issue for this class as they have to observe many slides and microscopic organisms.	12/11/2011 - Students were sometimes challenged in their ability to identify their collections to an adequate taxonomic level. There was a lot of variation in the effort students put in in identification. We need to build up a library of field guides to assist students in their identification and make better use of what is currently available in the campus library.
Department - Biological Sciences (BIOL) - BIOL 1D - MOLECULAR GENETICS - SLO 1 - Structure and function - Explain the relationship between structure and function as observed in key enzymes used in DNA replication, transcription and translation. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 1D - MOLECULAR GENETICS - SLO 2 - Scientific Process - Demonstrate an understanding of how experimental evidence is used to draw conclusions regarding the structure and function of important genetic molecules. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active			
Department - Biological Sciences (BIOL) - BIOL 23 - INTRODUCTION TO BIOTECHNOLOGY - SLO 1 - Application of Biotechnology - Students can explain what biotechnology is, and how it influences medicine, agriculture, and daily life. (Created By Department - Biotechnology (BTEC)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are asked to research and orally present both the positive and negative aspects of a specific, current topic in biotechnology. **Assessment Method Type:** Observation/Critique	09/25/2012 - Spring 2012 was the first quarter this was officially taught at Foothill (rather than Mountain View High School - which is a different demographic). There were only 9 students in the class, so data collection doesn't seem appropriate. There were problems with plagiarism that will need to be addressed in future classes. **Result:** Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** A dedicated space for students to use for study purposes where there is an instructor and lab supplies available would be helpful.	
Department - Biological Sciences (BIOL) - BIOL 23 - INTRODUCTION TO BIOTECHNOLOGY - SLO 2 - Scientific Process - Students can apply the scientific method to study a question (Created By Department - Biotechnology (BTEC)) **Course-Level SLO Status:** Active	**Assessment Method:** Students are given multiple opportunities throughout the quarter to apply the scientific method, such as simple, student-driven lab experimentation and other inquiry-based biotechnology activities. **Assessment Method Type:** Class/Lab Project **Target:** 85% of the students should show mastery of the concepts of the scientific method by the end of the quarter, as measured by improvement on related assignments.	09/25/2012 - Even though the sample size was small (N=9), students generally made improvements on their understanding of the scientific method over the course of the quarter. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** A dedicated space for students to use for study purposes where there is an instructor and lab supplies available would be helpful.	
Department - Biological Sciences (BIOL) - BIOL 40A - HUMAN ANATOMY & PHYSIOLOGY I - SLO 1 - Homeostasis - The student can identify how the integumentary and skeletal system contributes to homeostasis (Created By Department - Biological Sciences (BIOL))	**Assessment Method:** Embedded question on an exam (Bio 40A). **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the class will correctly answer the question on the exam (Bio 40A).	01/30/2013 - 89% of the students were able to answer this question correctly. This number is better than our target number of 80%. Generally, we do a credible job in emphasizing the importance of this SLO to students. Nevertheless, I feel that we can do a better job in reach a higher percentage of students that understand how the integumentary and skeletal system contribute to	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active		homeostasis. Further, upon reflection, I believe we need to consider how all of the organ systems covered in this class should be apart of this SLO. **Result:** Target Met **Reporting Year:** 2012-2013 **Resource Request:** I believe that if we expand this SLO to include all of the organ systems covered in this course we will need more time to develope effective teaching stratigies to meet this expanded SLO. Thus our load factors for lab should be increased.	
		12/16/2011 - In this assessment 83% of the students answered the question correctly **Result:** Target Met **Reporting Year:** 2010-2011	
		12/15/2011 - 1A. Most students were able to understand how each system contributed to homeostasis. However, students understanding of the integumentary system's contribution to homeostasis was less robust than for the skeletal system.[MM] 1B.Structure ? function as it pertains to histology: For example various epithelium , cartilage vs bone tissue , blood vs bone tissue. ~ 60% missed during the first lab exam As the quarter progressed the failure rate decreased to 15% for the last lab exam It became clear that in order to have a successful SLO I need to reinforce and repeat and practice the concept with its examples every lab.[JF Fall10] Bio 40A Melia f10: I divided this SLO into two questions. One designed to determine if students could identify how the integumentary system contributes to homeostasis and a second question	12/15/2011 - 1A. none[MM] 1B. Histology for the 40A students, as it is very new to them, is overwhelming. They have a hard time using their knowledge in terms of function to predict structure and vice and versa. I believe more time will be necessary this coming quarter to increase significantly the positive outcome. More examples will be necessary in particular using entire organ systems instead of isolating various tissues. SLO was evaluated during a lab exam using microscopes and histology slides.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		to determine if they understood the relationship between the skeletal system and homeostasis. The question concerning the skin and homeostasis was answered correctly by 80% of the students and the question concerning bone tissue and homeostasis was correctly answered by 75% of my students. Both of these responses show that a high proportion of the students are getting the connection between homeostasis and these two organ systems. [MM] JENNY FICHMANN Bio 40A F10:~ 60% missed during the first lab exam As the quarter progressed the failure rate decreased to 15% for the last lab exam It became clear that in order to have a successful SLO I need to reinforce and repeat and practice the concept with its examples every lab. [JF] **Result:** Target Met **Reporting Year:** 2010-2011 **Resource Request:** we need more as well as better slides to demonstrate histology and the structure of the skin in particular. Our slides are old, worn out, broken and generally need replacement.	I asked them to think about what they should see under the microscope and relate it to the initial question before looking into the microscope. In my previous quarter SLO's, I mentioned that it will be crucial to teach the students from the first lab on the use of microscope and thinking along the way of structure ? function. This quarter I started teaching them and practicing with them and the failure rate decreased significantly.[JF Fall10] Melia F10: Even though the response to my questions indicated a high degree of understanding I think I can improve on this. I intend to bring into the lab some group exercises that emphasis and highlight the importance of these two concepts to the class. For every organ system I will have a group exercise which will help students connect the dot between what we are learning about each system and this relates to homeostasis. [MM] JENNY FICHMANN Bio 40A F10: Histology for the 40A students, as it is very new to them, is overwhelming. They have a hard time using their knowledge in terms of function to predict structure and vice and versa. I believe more time will be necessary this coming quarter to increase significantly the positive outcome.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
			More examples will be necessary in particular using entire organ systems instead of isolating various tissues SLO was evaluated during a lab exam using microscopes and histology slides I asked them to think about what they should see under the microscope and relate it to the initial question before looking into the microscope In my previous quarter SLO's , I mentioned that it will be crucial to teach the students from the first lab on the use of microscope and thinking along the way of structure ? function. This quarter I started teaching them and practicing with them and the failure rate decrease significantly. [JF] 1A. I feel we need more as well as better slides to demonstrate histology in general and the structure of the skin in particular. Our slides are old, worn out, broken and generally need replacement. Better slides would make it easier to address the issue of the skins contribution to homeostasis.[MM]
Department - Biological Sciences (BIOL) - BIOL 40A - HUMAN ANATOMY & PHYSIOLOGY I - SLO 2 - Structure and function - The student can identify the importance of structure/ function relationship.	**Assessment Method:** Embedded question on an exam (Bio 40A) **Assessment Method Type:** Exam - Course Test/Quiz **Target:**	01/30/2013 - Only 76% of the students answered this question correctly. This number is lower than out target figure. This SLO is a more difficult concept to get students to understand and it requires the students to engage more reflectively	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
(Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	80% of the class will correctly answer the question on the exam (Bio 40A).	with the material and requires less of a wrote memory response. As such teaching strategies to bring students to a greater understanding of the relationship of form and function require more thought, time and energy. These commodities are in short supply given the demands of our teaching schedule and the time consuming requirements of our other responsibilities. We would be better able to meet this challenge if our teaching loads for labs reflected the true amount of time effort we put into them. **Result:** Target Not Met **Reporting Year:** 2012-2013 **Resource Request:** higher loads for teaching labs	
		12/16/2011 - 87% of the students answered this question correctly **Result:** Target Met **Reporting Year:** 2010-2011	
		12/15/2011 - It is much easier for the students to grasp this concept as I continually lectured on it and I illustrate it with various examples. Continuous short questions ? short answers were used to assess them during lecture so that structure ? function became a second nature to them.[JF Fall10] Melia F10 This SLO is continuously being emphasized through out the class both in lecture and lab and as a result I think the students have a firm grasp of this SLO. [MM] Jenny Fichmann Bio 40A F10: It is much easier for the students to grasp this concept as I continually lectured on it and I illustrate it with various examples. Continuous short questions ? short answers were	12/15/2011 - Better slides are needed, more microscopes are needed (to improve the student/microscope ratio) and other models are needed as well. Identifying the importance of structure and function requires good "model systems", like histology slides or models to better demonstrate the relationship between the two ideas. Without these "model systems" it is very difficult to illustrate in a meaningful way to students the relationship between structure and function

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		used to assess them during lecture so that structure ? function became a second nature to them Was assessed during quizzes (scantron) but also during lecture by asking them directly the question [JF] **Result:** Target Met **Reporting Year:** 2010-2011 **Resource Request:** Slides, microscopes, models	
Department - Biological Sciences (BIOL) - BIOL 40B - HUMAN ANATOMY & PHYSIOLOGY II - SLO 1 - Homeostasis - The student can identify how the nervous system and cardiovascular system contributes to homeostasis. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam (Bio 40B). **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the class will correctly answer the question on the exam (Bio 40B).	05/16/2012 - Two different questions were used to asses student understanding of this SLO. Of the 150 students taking the final only 73% were able to correctly answer the questions (7% below the target). **Result:** Target Not Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** A more explicit and focused discussion in lecture and lab about how the nervous system and the cardiovascular system works to maintain homeostasis might help more students to understand this important aspect of the course. It is also possible that the wording of the questions confused students and prevented them from understanding the questions. I propose to reword the questions and emphasis the material in lab and lecture more and then compare my results to these.	
		11/15/2011 - 82% of the class got the question correct (Bio40B Fall 11 JL). **Result:** Target Met	01/08/2012 - Students achieved goal of understanding how these two physiological systems contribute to homeostasis. Continue to

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Reporting Year: 2011-2012 **GE/IL-SLO Reflection:** Students successfully used critical thinking skills to analyze a question concerning the cardiovascular system and homeostasis.	provide information to students so that they are knowledgeable about the importance of homeostasis. Continue to introduce concepts in both lab and lecture.
Department - Biological Sciences (BIOL) - BIOL 40B - HUMAN ANATOMY & PHYSIOLOGY II - SLO 2 - Structure and function - The student can identify the importance of structure/ function relationship. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam (Bio 40B). **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the class will correctly answer the question on the exam (Bio 40B).	05/16/2012 - Only 78% of the students were able to correctly answer this question (2% short of the target) **Result:** Target Not Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** The target number was missed by only 2% and thus almost reached. It is possible that this could be accounted for by statistical error or random deviation or it could be real. The nature and structure of the question may have confused enough students to cause this lower score and so I will reword the question and compare my results to this quarter to look for improvement.	
		01/24/2012 - Embedded questions involved neurophysiology (action potentials, events at chemical synapses), anatomy of a reflex arc, and resting membrane potential). Students continually have difficulty with these subjects. It appears that students do not link electrochemical events of neurons to the big picture of the nervous system. Students may benefit from animations and more biological examples on these subjects in future lectures.In the second part of the course, many students did not perform well probably because of the large and diverse amount of information presented. It may be a good idea to explore different options for breaking up the information in terms of testing them.	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Result: Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** item analysis from lecture exams (# of wrong responses tallied from each question)	
		11/19/2011 - 81% of the students correctly answered the question concerning structure/ function relationships **Result:** Target Met **Reporting Year:** 2011-2012	11/19/2011 - Continue to provide information during lecture and lab to reinforce importance of structure/ function relationships. Models, dissection and microscopes in lab provide structural basis for this understanding.
Department - Biological Sciences (BIOL) - BIOL 40C - HUMAN ANATOMY & PHYSIOLOGY III - SLO 1 - Homeostasis - The student can identify how the urinary system and endocrine system contributes to homeostasis. (Created By Department - Biological Sciences (BIOL)) **Start Date:** 06/20/2011 **End Date:** 08/18/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam (Bio 40C). **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the class will correctly answer the question on the exam (Bio 40C).	04/06/2012 - At least 8 questions in the exam targeted the hypothalamic pituitary axis, hormone effects on & sensitivity to target cells, & stimuli for hormone secretion. 80% or more students answered half of the questions right; people still continually miss questions on negative feedback mechanisms of hormone secretion. At least 8 questions in the exam targeted general kidney function, renal physiology, mechanisms of water balance, & acid-base balance. 80% or more people answered 5 of the questions correctly. I expected many students to struggle with renal physiology, especially the hormones that affect GFR, reabsorption, & water balance. **Result:** Target Met **Reporting Year:** 2011-2012 **Resource Request:** 2nd exam	
		10/12/2011 - 85% of the students answered this question correctly. **Result:**	10/19/2011 - as the target for success was exceed no changes are needed

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 40C - HUMAN ANATOMY & PHYSIOLOGY III - SLO 2 - Structure and function - The student can identify the importance of structure/ function relationship. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam (Bio 40C). **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the class will correctly answer the question on the exam (Bio 40C).	04/06/2012 - At least 10 questions on the exam targeted (directly & indirectly) some structure/function relationship. 80% or more people answered only 3 of these questions correctly. I already have new ideas about how to re-word some questions and stress these relationships more in lectures. **Result:** Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** exam 2	
		09/23/2011 - only 63% of the students got this question correct **Result:** Target Not Met **Reporting Year:** 2010-2011	09/23/2011 - I think that the question was not designed properly. The wording of the question needs to be improved. In past assessments, using different questions, students were able to perform at or above the target of success.
Department - Biological Sciences (BIOL) - BIOL 41 - MICROBIOLOGY - SLO 1 - Disease Prevention - Students will discuss the role of the health care practitioner in prevention of nosocomial infection (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Written and multiple-choice questions on midterm and final exams **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of students will answer the test questions correctly	09/27/2012 - I addressed this SLO by asking a written question on the final exam that stated "As a health care professional, you are made aware of a new strain of bacteria that has infected patients that stayed in the hospital you work in, but hasn't been found anywhere else. How does this relate to our discussion of opportunistic pathogens? What 3 things could you do to help stop the spread?" This question was more complex than the one used last year as I wanted them to figure	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		out that I was asking about a nosocomial infection- could they identify the description. It also made them think more deeply about the fact that opportunistic pathogens are often the cause of these infections and why that is the case. Due to the increased amount of knowledge they needed to have to answer this question correctly, the scores were lower than in past years. On this question 60% of students got complete credit and were able to discuss the role of decreased immunity and more exposure to pathogens in the hospital. The remaining 40% received more than half of the points for this question, indicating that they had a basic understanding of the concept, but maybe not about the opportunistic pathogen's role. 100% of the students were able to come up with the 3 things they could do to help stop the spread which is the basis for the majority of the SLO. Overall, I was pleased with these results since all of the students successfully completed the part of the question that was about their role in the infection. I will modify my discussions and do another in class activity related to the opportunistic pathogens becoming dangerous in hospitals in order to help the rest of the students gain the ability to think about these threats. **Result:** Target Met **Reporting Year:** 2011-2012	
		12/11/2011 - 1. ?Students will discuss the role of the health care practitioner in prevention of nosocomial infection? ? Amy assessed this SLO by asking a written question on her final exam that stated, ?What is a nosocomial infection? As a health care practitioner, what are three things you can do to help prevent them?? 42 students took this final and she broke down their ability to answer this question into 3 groups. ? Full credit: 90% of students answered this question perfectly	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		? Partial credit: 10% of students got the main idea of what a nosocomial infection was but didn't name three ways they could help prevent them (possible they didn't read the question?) ? No credit: 0% every student got some credit for this question. Amy's reflection: As can be seen from the vast majority of students' scores, this SLO was well-achieved by students. So, Amy plans to continue addressing this topic in the way she is currently doing so. ? Carolyn assessed this on her final exam in two ways: a. The first utilized a list of facts about MRSA from the CDC's web site. Students were presented with the list and then to relate the MRSA information to what they had learned in class. They were NOT specifically prompted to mention nosocomial infection but there were many ways the MRSA info could tie in with nosocomial infections and prevention. ? Of the 46 students who took the final, 17 of them explicitly mentioned the role of the healthcare provider in preventing nosocomial infections; 17 students made an indirect reference (e.g. ?it's important for healthcare providers to wash their hands, properly clean equipment, etc.); 12 students didn't mention this at all. b. The second approach utilized a question that asked explicitly asked students, ?What are three DIFFERENT things you can do that will help stop the spread of nosocomial infections in your practice as a healthcare provider?? When specifically prompted, all of the students answered with at least some success; that is, no students failed to identify at least one preventative measure. ? The majority (31) were able to describe (at least) three distinct measures (with several students offering more than three). Thirteen students identified two preventative measures, and two	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		students only identified one. Carolyn's reflection: Students demonstrated excellent mastery of this outcome. I would like for the students to be able to identify situations in which there is higher risk of nosocomial infections without being prompted, though. In future classes, I would like to try giving them similar exercises to practice in class rather than springing this sort of question on them only at the time of the final without ever having had an opportunity to think in this context before. **Result:** Target Met **Reporting Year:** 2010-2011	
	Assessment Method: Written questions answered during in-class activities **Assessment Method Type:** Essay/Journal **Target:** 100% of students will be able to answer these written activities correctly		
Department - Biological Sciences (BIOL) - BIOL 41 - MICROBIOLOGY - SLO 2 - Compare healthy and disease states - Students will compare and contrast the role of normal flora, opportunistic and obligate pathogens in both health and disease states (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam questions **Assessment Method Type:** Exam - Course Test/Quiz	09/27/2012 - For this SLO, I used a written question on the second midterm and one on the final exam. The first question read "What do pathogens have that other microbes do not? Give 3 specific examples in 3 different types of pathogens." We had discussed many different kinds of pathogens and the fact that virulence factors is what make them pathogenic. First and most importantly, 83% of students were able to name 3 categories of pathogens and give examples of their virulence factors. That more than exceeded my goal and so I will continue to teach to this portion of the SLO in the same manner. 50% of the students were able to get full credit on that question indicating they fully understood the term "virulence factor" and	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		were able to apply it. I hope to increase that number next quarter by a new in class activity that will help drive the point home- all pathogens must have a WAY to make us sick. The question on the final that addressed this SLO was, "As a health care professional, you are made aware of a new strain of bacteria that has infected patients that stayed in the hospital you work in, but hasn't been found anywhere else. How does this relate to our discussion of opportunistic pathogens? " As discussed in my reflection of SLO 1, 60% of the students got this fully right. I plan to work on making further connections between what pathogens have that normal flora do not by adding to an in class activity I already do about virulence factors. **Result:** Target Met **Reporting Year:** 2011-2012	
		12/11/2011 - 2. ?Students will compare and contrast the role of normal flora, opportunistic and obligate pathogens in both health and disease states ? ? Amy assessed this SLO through a written question on a lecture exam that asked, ?We have discussed many different human pathogens. In general, what do pathogens have that other microbes do not? Give one specific example each for two different types of pathogens. For the 45 students that took this exam, their answers were broken into three groups. ? Full credit: 49% of students were able to answer this question and get full credit ? Partial credit: 40% of students- about half of these understood the basic idea of virulence factors being the reason that pathogens are harmful, but were unable to identify specific examples. The other half of these students gave a couple examples of a virulence factor that a particular microbe contained, but couldn't identify the ?general? thing that pathogens must have.	12/11/2011 - Amy - more in-depth work during the active learning activity Carolyn - more practice with the application of their knowledge to real-world data outside of exam situations.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		? No credit: 11% of students left this question blank indicating they had no idea what the differences between these different organisms are. Amy's reflection: Amy already incorporates an active learning activity in which they look up virulence factors for a particular microbe in groups and report to the class on what these factors are. At the end of the activity, we discuss that there are a wide variety of virulence factors and that microbes are able to be pathogenic due to these factors. So, in the future, she will continue this activity but do it in more depth. If some of the groups had normal flora/opportunistic pathogens to look up, they might better see the distinct differences between these microbes and true pathogens. ? Carolyn most directly assessed this in several ways on both the second midterm exam and on the final exam. Two of these are described in detail, below. a. The first was a multiple-choice question on the final that asked, ?What's the primary difference between a pathogenic microbe and a nonpathogenic microbe,? with the correct answer identified as, ?pathogenic microbes have more virulence factors than nonpathogenic microbes.? ? Of the 46 students who took the final, 32 selected the correct answer. ? Of the 14 who answered incorrectly, 12 chose the same wrong answer: ?pathogenic microbes are foreign, nonpathogenic microbes are normal flora.? b. The second approach utilized a list of facts about MRSA from the CDC's web site. Students were presented with the list and then to specifically ?describe one way in which the information on the fact sheet relates to our Bio 41 unit on normal flora and pathogenicity.? They were NOT specifically prompted to mention any particular differences or similarities among	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		pathogens/opportunists but there were many ways the MRSA info could tie in with these concepts. Thirty-nine students explicitly mentioned differences between normal flora and pathogens such as virulence/virulence factors, the relationship to normal flora, opportunism, microbial antagonism, etc.; five students didn't explicitly mention these concepts but instead focused on MRSA getting past the immune system (their answers were much more about the host perspective rather than that of the microbe). Interestingly, the two who made no connections received failing grades on the overall exam suggesting that perhaps it isn't just a breakdown with this particular concept. ? Carolyn was very pleased with the number of students who demonstrated mastery of this SLO by discussing these concepts in the open-ended question. However, it was interesting that the students who missed the multiple-choice question almost all chose the same wrong answer, but later accurately discussed the idea that normal flora can be opportunistic. This seemed incongruous, and perhaps some of these errors can be attributed to misreading the MC question, or failing to read the answer choices correctly? **Result:** Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 41 - MICROBIOLOGY - SLO 3 - Treatments of Bacterial and viral infections - distinguish between bacterial and viral pathogens in terms of structure and chemotherapeutic interventions (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam questions **Assessment Method Type:** Exam - Course Test/Quiz	09/28/2012 - To assess this SLO, I used many questions on the 2nd midterm and the final. A written question on the final read "Draw a bacterium and an enveloped virus and compare/contrast their structures. Which one do we have more medications to fight and why?" This question addresses all parts of the SLO and 46% were able to do it for full credit. This means that they could draw and label all major structures on both the virus and the bacteria, that they could	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		explain the difference between a virus and a bacteria and that they understood why we have so many more medicines for bacteria. Another 38% got more than half credit which means that 84% of the class understood the majority of points asked in the question. This is a fairly good result, but I think it can be improved. First, this was a very complex question and I think next quarter I will ask it in separate parts so the students are sure to answer all sections. I think that will help more students get full credit. I will also add an in class activity near the end of the course that gets at some of the finer differences between these microbes. I also had many multiple choice questions on the final and 2nd midterm about which medications were used for which pathogens, what those medications targeted and which structures are found in which microbes. The average for these 12 questions was 75%. This is a little lower than I would like, but some of the questions did require more thought and those that just required knowledge of the basic structural differences between the two were answered correctly 85% of the time. I think this is a reasonable result and will continue to teach to this portion of the SLO in the same way. **Result:** Target Met **Reporting Year:** 2011-2012	
		12/11/2011 - ? Amy assessed this SLO through a group of multiple-choice questions on the final exam that related to the differences in structure/ control of viruses and bacteria. These included mostly matching questions asking students to identify which microbes (including bacteria, viruses and eukaryotic pathogens) had particular structures. For example, a student might be asked which are acellular, which contain peptidoglycan, which undergo mutation, which are obligate	12/11/2011 - Carolyn's reflection: it seems that students successfully grasp the concept that similarities and differences amongst pathogens influence treatment choices. In addition, most were also able to accurately discuss at least a couple of these similarities/differences in more detail. With this in mind, there is no plan to change the course in

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		intracellular parasites, etc. She also asked multiple -choice questions to determine if students understood treatments for bacterial vs. viral infections. ? Overall on the 5 questions that addressed structural differences between viruses and bacteria, 90-95% of students answered these questions correctly indicating the ability to compare/contrast these microbes. This area seems to be well covered in the course and doesn't need to be improved. ? The 3 questions on the final that addressed the treatment of infection by these microbes did not prove so successful. o 92% were able to answer that lysozyme works against bacteria o 85% were able to identify viruses as the main targets for vaccines (preventative treatment) o Only 56% were able to determine that the target of antibiotics that inhibit translation would be bacteria. For this, improvement could be made with more discussion of differences between viruses which use our cellular machinery and prokaryotes which have their own structurally distinct translational machinery. For this area, I need to ask more questions on the final about this topic to get a better overall average for interpretation. Obviously the questions about structure of viruses and bacteria show the students overall gather the important information. So, I need to take it one step further to more discussion of how to kill the different pathogens. Carolyn assessed mastery on the second midterm with both multiple-choice and open-ended questions. In addition, these concepts were assessed on the comprehensive portion of the final exam with the following question: ?Use this space to compare and contrast viruses and bacteria. Identify important similarities and differences (make sure that you've very clearly indicated which are points of similarity and which	regard to this SLO. Amy - Greater variety of exam questions to better understand which concepts the students do and don't grasp

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		are points of difference). Then, explain why these are important to you as a future health care professional.? There were five possible points. ? Forty students made the point that understanding similarities and differences help care providers choose appropriate treatments. ? Forty-one students could identify at least two similarities or differences. **Result:** Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 45 - INTRODUCTION TO HUMAN NUTRITION - BIO 45 CL-SLO Food Labels - Upon successful completion of the course, students will be able to interpret food labels, explain the rationale for the information, and teach a potential patient how to use the labels to make informed dietary choices. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Exam **Assessment Method Type:** Exam - Course Test/Quiz	06/20/2012 - Ninety-five percent of students correctly answered the exam question about health claims. The exam question about percent daily values was answered correctly 88 % of the time. More than 90% of students correctly answered the two questions about nutrients on food labels. there is a short essay exam question specifically asking students about using food labels to make recommendations to friends/family, and more than 95% of students are able to earn a passing score on the question while more than 75% answer it with a perfect score. **Result:** Target Met **Reporting Year:** 2011-2012	06/20/2012 - A great majority of students are able to successfully answer exam questions about food labels. No changes to the course material or assessments are planned at this time.
		12/11/2011 - 95% of the students were able utilize food labels to make informed dietary decisions. The only concept with which students tended to have difficulty was when they had to calculate values when following diets other than for 2000 kcal. **Result:** Target Met **Reporting Year:** 2010-2011	12/11/2011 - More demonstration of daily values calculations for diets higher or lower than 2000 kcal.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 45 - INTRODUCTION TO HUMAN NUTRITION - BIO 45 CL-SLO DGAs - Upon successful completion of the course, students will be able to utilize the dietary Guidelines for Americans to plan a diet for both healthy individuals as well as individuals at increased risk for chronic illnesses such as heart disease and type 2 diabetes. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students participate in a quarter-long written analysis project. It involves collaboration with 3-4 classmates to analyze the dietary intake of a simulated "patient" and make appropriate suggestions to modify their intake to reduce their risk for diet-related disease. **Assessment Method Type:** Case Study/Analysis **Target:** Approximately 85% of the students will actively participate in the project, accurately analyze the data and make appropriate suggestions to their "patient."		
	Assessment Method: One of the midterm exams asks several questions requiring the students to recall and apply the DGAs **Assessment Method Type:** Exam - Course Test/Quiz **Target:** About 85% of students will answer these questions with 90% accuracy.	12/11/2011 - 100% of students were able to answer these questions appropriately. The current teaching techniques and assignments seem to be working well. **Result:** Target Met **Reporting Year:** 2011-2012	
Department - Biological Sciences (BIOL) - BIOL 45 - INTRODUCTION TO HUMAN NUTRITION - BIO 45 CL-SLO Dietary Analysis & Planning - Upon successful completion of the course, students will be able to utilize dietary analysis software to analyze current dietary intake and subsequently make suggestions for appropriate dietary modifications, and explain the rationale for these recommendations. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students participate in a quarter-long written analysis project. It involves collaboration with 3-4 classmates to analyze the dietary intake of a simulated "patient" and make appropriate suggestions to modify their intake to reduce their risk for diet-related disease. **Assessment Method Type:** Case Study/Analysis		

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 54H - HONORS INSTITUTE SEMINAR IN BIOLOGY - SLO 1 - Critical Thinking - The student can critically analyze a topic covered in the course. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will write a reflection paper indicating their understanding and biases prior to the course and how those have evolved by the end of the course. **Assessment Method Type:** Essay/Journal **Target:** All students will demonstrate improvement by the end of the course.	06/28/2012 - 14/18 students demonstrated high improvement in their "pre" and "post" understanding of the topic (winter, 2012 - Vaccines). The remaining 4 students showed some improvement. **Result:** Target Met **Reporting Year:** 2011-2012	06/28/2012 - To get a better understanding of where students are in their knowledge/understanding of the topic, I think it will be better to ask them at two separate times - once at the beginning of the course. Students may have a hard time evaluating where they were 12 weeks prior to learning new material, making measurement of improvement difficult.
Department - Biological Sciences (BIOL) - BIOL 54H - HONORS INSTITUTE SEMINAR IN BIOLOGY - SLO 2 - Communication - The student can use new vocabulary relevant to topic covered in the course. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be given weekly vocabulary lists pertinent to the assigned readings and course topic. Questions on the readings/vocabulary will measure understanding. **Assessment Method Type:** Discussion/Participation	06/28/2012 - Students were assigned weekly vocabulary lists and the discussions for the week required understanding the new terms. While all students turned in their vocabulary lists, it was hard to assess if they truly grasped the terms. **Result:** Target Not Met **Reporting Year:** 2011-2012	06/28/2012 - Rather than ask students to turn in a list of terms each week, it will be better to require them to include the terms in some way in their final paper and class presentation. Will redesign assessment in the future.
Department - Biological Sciences (BIOL) - BIOL 54H - HONORS INSTITUTE SEMINAR IN BIOLOGY - SLO 3 - Information Literacy - The student can identify and critically evaluate appropriate sources of information. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Final reflection paper will include a component asking students to find and evaluate information from 1) a website and 2) a publication. **Assessment Method Type:** Essay/Journal	06/28/2012 - All students were asked to include an evaluation of their resources as a separate component to their final reflection paper. Instructions were given as to how to perform this evaluation. Several students did not follow the instructions, rather, they used terms like "this resource was good." **Result:** Target Not Met **Reporting Year:** 2011-2012	06/28/2012 - Again, like with the vocabulary lists, a stronger emphasis on learning what "evaluation" of a resource means is needed. Rather than have a librarian come and give a presentation for finding information, I will schedule a session to discuss how to critically evaluate information.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 58 - FUNDAMENTALS OF PHARMACOLOGY - SLO 1 - Physiological Processes - The student will be able to describe the basic functions and mechanism of action of drugs and the physiologic responses of various body systems (Created By Department - Biological Sciences (BIOL)) **Start Date:** 04/08/2012 **End Date:** 06/28/2012 **Course-Level SLO Status:** Active	**Assessment Method:** 100 question multiple choice test **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of students will score 75% or better	01/09/2013 - 92% of the students score a 75% or better for a Final Grade in the class. Total class average for Final Grades of 50 students: 86% **Result:** Target Met **Reporting Year:** 2012-2013 06/29/2012 - 85% of the students received a C or better Breakdown: 14As, 6Bs, 4Cs, 1Ds, 3Fs **Result:** Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** Entire class average was 85.4% which demonstrates overall mastery of the concepts as a whole	
Department - Biological Sciences (BIOL) - BIOL 58 - FUNDAMENTALS OF PHARMACOLOGY - SLO 2 - Drug interactions - The student will be able to list the side effects, desirable and undesirable actions and the appropriate remedies of drug interaction. (Created By Department - Biological Sciences (BIOL)) **Start Date:** 04/08/2012 **End Date:** 06/28/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Midterm #1 100 points Midterm #2 100 points Final Exam 200 points Top 50 Drugs 100 points _____ TOTAL POINTS 500 points **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 80% of the students will receive a 70% or higher on all methods of assessment	01/09/2013 - 92% of the students score a 75% or better for a Final Grade in the class. Total class average for Final Grades of 50 students: 86% **Result:** Target Met **Reporting Year:** 2012-2013 06/29/2012 - 85% of the students received a C or better Breakdown: 14As, 6Bs, 4Cs, 1Ds, 3Fs **Result:** Target Met **Reporting Year:** 2011-2012	

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 8 - BASIC NUTRITION - BIO 8 CL-SLO Food Labels - Upon successful completion of Bio 8, students will be able to interpret food labels and use them to make informed dietary choices. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Short answer exam questions **Assessment Method Type:** Exam - Course Test/Quiz	12/12/2011 - Most of the students were able to discriminate label nutrients that should be emphasized versus those that should be limited. A significant number of students, though, were unable to perform basic calculations to determine the % Daily Value for anything other than a 2000 kcal diet. **Result:** Target Met **Reporting Year:** 2011-2012	12/12/2011 - Will ask the students to calculate the %DV for a food they actually consumed during the week of their food dairy, using their own caloric intake. I.e. plan to personalize the calculation for the individual student.
Department - Biological Sciences (BIOL) - BIOL 8 - BASIC NUTRITION - BIO 8 CL-SLO DGAs - Upon successful completion of Bio 8, students will be able to utilize the Dietary Guidelines for Americans to plan a diet for themselves and their family. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students complete a self-dietary analysis using a four-day food diary and analyze their intake as it compares to the recommendations in the DGAs. Their analysis is written as a formal report. **Assessment Method Type:** Case Study/Analysis	12/12/2011 - It was surprising that although the students were told point-blank that they were going to have to identify food groups and amounts for both their regular mid-term AND their comprehensive final exams, several left the question completely blank. However, of those students who did answer these questions, about 95% of them were able to do so correctly. **Result:** Target Met **Reporting Year:** 2011-2012	
Department - Biological Sciences (BIOL) - BIOL 8 - BASIC NUTRITION - BIO 8 CL-SLO Dietary Analysis & Planning - Upon successful completion of Bio 8, students will be able to utilize dietary analysis software to analyze their current dietary intake and use this information to make suggestions for appropriate dietary modifications. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students complete a self-dietary analysis and make written recommendations for appropriate dietary modifications. **Assessment Method Type:** Case Study/Analysis		
Department - Biological Sciences (BIOL) - BIOL 9 - ENVIRONMENTAL BIOLOGY -			

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
SLO 1 - Global/Community Conciousness - Student will evaluate environmental issues and describe possible solutions at both the local and global level (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Advocacy Campaign Assignment. I have found that one of the biggest obstacles to change is that generally people are uninformed about how their behavior affects the environment. I would like each person (or you may work in groups of two to three) to come up with an advocacy campaign that ties together the environmental consequences of human actions at both the local and global levels Criteria for picking topic include: you feel passionate about the topic, you want to learn more about it, and you want to share that knowledge with others. Your grade will be based upon three things: 1. Research on your topic: (worth 50% of your grade) ? Notes from your research ? info and facts in your words or properly cited. This will be research you have completed on the topic from the internet, books etc? Your textbook website has long lists of resources related to each chapter so you might find some resources there. (30 pts) ? Research could also include interview with a person of authority (a scientist working on the problem, a local farmer etc?), or volunteering (for example if you wanted to talk about invasive species you could volunteer for a day on a restoration project). ? A summary (one page is fine) on gathered info and your interview ? tie your research together. This can be a bulleted list that is to help you focus your advocacy campaign (10 pts) ? One paragraph summary on how this info relates to you, your family, and/or society. If working in a group, each person should turn this in separately (10 pts) ? A presentation for the class (25 points) ? The presentation should overview your	12/12/2011 - Generally this is well exemplified in their projects. Student presentations/posters illustrate the local issues and put them in a global context. I think the evidence that this SLO is being met is more anecdotal in that the audience (students) are stimulated to ask questions following other student's presentations. **Result:** Target Met **Reporting Year:** 2010-2011	12/12/2011 - I think I need to tighten up the assignment so that it gets away from "reporting" and more towards advocacy. I would like to students to produce a final product that could be used outside of the classroom to convey a message. Right now about 60% of the students do not quite get this part of the assignment.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	topic. This should be a 5-10 minute PowerPoint presentation. You should see me for help if you are unfamiliar with PowerPoint. I will post a list of helpful PowerPoint tips on the ETUDES website. 2. A method for sharing your advocacy campaign with the campus. (25 points) ? Possible methods of sharing include posters, a YouTube video, create a website or other methods of getting information out to the public . **Assessment Method Type:** Presentation/Performance		
Department - Biological Sciences (BIOL) - BIOL 9 - ENVIRONMENTAL BIOLOGY - SLO 2 - Ecosystem Processes - The student will be able to explain and provide examples of the movement of energy and matter through ecosystems and discuss human impacts that disrupt these processes. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Student will be given two to three exam questions in which they distinguish between the flow of energy and the cycling of matter (biogeochemical cycles). Students must also evaluate human impacts and disruptions of these processes and describe possible solutions. **Assessment Method Type:** Exam - Course Test/Quiz	12/12/2011 - exam questions in both the midterm and final were well answered. Probably the biggest problem is in understanding subtleties in the different but related disruptions of the biogeochemical cycles. Overall students do understand energy flows and matter cycles **Result:** Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** This SLO meets the requirements for communication and critical thinking as the students need to be able to explain the cycling of matter between the biotic and abiotic systems of Earth. I am going to ask them to increase their critical thinking by recognizing the patterns of similarity in the human disruptions of these cycles.	08/27/2012 - Students do really well on this SLO. I am going to develop a different means of assessment in which the students research the cycles and teach them to each other in hopes of getting them into a deeper understanding of the processes. 12/12/2011 - Reword exam questions so that they cannot get by with generalities of disruptions: for example when asked to discuss the human disruptions of the carbon cycle and the nitrogen cycle, students often cite logging and deforestation but do not explain how the cycles are disrupted - a better worded question would probably elicit those differences. Winter 2011 - reworded questions to remove ambiguity and prevent vague but correct answers. Overall improvement in explanations of cycles and disruptions.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Biological Sciences (BIOL) - BIOL 9 - ENVIRONMENTAL BIOLOGY - SLO 3 - Global/Community Conciousness - Student will evaluate their personal impact on the earth. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Student will be required to carry out a three day project in which they track all of their resource use (energy, material goods, food etc...). On the first day, they will be required to simply record all of the energy and matter that they use. On the second day, they will be required to reduce their resource use by 50%. By the third day, they will be required to reduce their impact by 100%. Students will be graded upon the quality of their reporting (with full recognition that 100% is probably impossible to obtain) and their self reflection of their impacts and their discussion evaluating wants and needs and how their lifestyle reflects wants and needs. **Assessment Method Type:** Class/Lab Project	12/12/2011 - This works really really well. Students really understand their personal impact and most students are able to decrease their impact scores by the end of the quarter by implementing simple changes in their lives. **Result:** Target Met **Reporting Year:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 9L - ENVIRONMENTAL BIOLOGY LABORATORY - SLO 1 - Scientific Process - Students will be able to apply the scientific process to evaluating environmental issues. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will design a research project on a local environmental issue related to a threatened or endangered species. They will be required to research causes and conflicts related to the listing of the species and then to report out to the other students in the class. At the end of the quarter, students have a mini conference to decide which of the researched species can be "funded. Essentially they have to act as experts and be prepared to argue for their own species in a time of limited budget and management resource availability. Criteria considered include species biology and population dynamics, effects on human/economic factors, feasibility of mitigating causes of loss. The students are each then required to write a short opinion	08/27/2012 - The students really do a great job with this project. **Result:** Target Met **Reporting Year:** 2011-2012 **GE/IL-SLO Reflection:** This project requires students to research and evaluate threatened and endangered species in California and determine which species should have resources allocated for conservation. This requires students to communicate and advocate (argue) on behalf of their assigned species and (following presentations) to critically evaluate which three (out of 15 or 20) species should receive conservation priority using the data presented.	08/27/2012 - This project works really well. It helps students to see where problems lie with conservation and management of species and make difficult decisions as to how humans decide which species to "save" based upon biological and financial decisions. One of the best parts of the project is that the students are able to see that the threats that face many of the species are the same and they can make conservation decisions that directly "help" one species but that may also indirectly help others.

Course-Level SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	on which three species should be saved and why based upon what they heard in the mini -conference. **Assessment Method Type:** Case Study/Analysis **Target:** 90% of the students should be able to think and adequately argue with reasons why their three choices are the best in times of limited resources for mitigation.	10/12/2011 - The students do a really good job arguing for their species using facts based upon their research findings. Probably the only area which could show improvement is if they could better relate the biological factors of the organisms themselves as part of the reason for those organisms' decline such as natural rarity or low reproductive rates. **Result:** Target Met **Reporting Year:** 2010-2011	10/12/2011 - I am happy with this assignment. I will probably try to include more instructions/or a resource with information on understanding innate biological reasons for predisposition to declining population sizes.
Department - Biological Sciences (BIOL) - BIOL 9L - ENVIRONMENTAL BIOLOGY LABORATORY - SLO 2 - Scientific Process - Students will demonstrate proficiency in research and sampling techniques to evaluate a local ecosystem and impacts upon that ecosystem. (Created By Department - Biological Sciences (BIOL)) **Course-Level SLO Status:** Active	**Assessment Method:** Over the course, students will be taught standard environmental sampling techniques for water quality and biodiversity assessment. They will be required to apply these techniques in their research projects due at the end of the course. **Assessment Method Type:** Class/Lab Project **Target:** 100% of the students should be able to adequately use basic instruments for testing environmental samples.	10/12/2011 - Basically this SLO is unmet due to the lack of resources available to do environmental testing and monitoring. The students are exposed to water quality monitoring on two of their field trips with materials owned by the sponsors of those field trips. **Result:** Target Not Met **Reporting Year:** 2011-2012 **Resource Request:** Tools for environmental quality monitoring. **GE/IL-SLO Reflection:** Due to the lack of resources, the students cannot initiate projects related to this SLO.	08/27/2012 - Due to the lack of resources, this SLO cannot be assessed. HOWEVER, hopefully during my sabbatical in 2013, I will be writing a series of labs that will help to find a solution to these resource limitations. 10/12/2011 - Due to the lack of resources available to buy materials for environmental quality monitoring, I will be changing this SLO for next year.