Annual Instructional Program Review Template for 2011-2012

Introduction to The Program Review Process for Instructional Programs

Program Review at Foothill College

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 using this template, 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. Administrator's comments/reflection/next steps

Foothill College Program Review Cycle:

2011-2012 All academic programs participate in an annual program review

2012-2013 1/3 of academic programs participate in comprehensive review, remaining 2/3 of programs update their annual program review

Contact: Office of Instruction and Institutional Research, 650-949-7240

Instructions: Complete this template with data on any degree, certificate, or pathway your department offers. Return the completed form to your Dean on the last day of Fall quarter.

Website: http://foothill.edu/staff/irs/programplans/index.php

2011-2012 Submission Deadline:

All program review documents are due to Deans by December 16

Basic Program Information

Department Name: **Biology**

Program Mission(s):

A. Prepare students for a successful career in the biological sciences, including students planning to transfer to a four year school.
B. Prepare students to be savvy consumers of scientific information, and provide a general education in the life sciences.
C. 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.
D. Support programs in allied health by providing an education in biological principles including anatomy, physiology, microbiology, nutrition and pharmacology.

Program review team:

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

Programs* covered by this review

Program Name	Program Type (A.S., C.A., Pathway, etc.)	Units**
Biology	A.S.	48
Pathway – Anatomy and Physiology	Pathway	N/A
Pathway – GE requirements in Natural Sciences	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.

**Certificates of 27 or more units must be state approved. If you have certificates that are 27 or more units that are not state approved, please indicate your progress on gaining state approval, with the tentative timeline for approval, or your plan for phasing out the certificate.

Section 1. Data and Trend Analysis

1.1. Program 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	2008-2009	2009-2010	2010-2011	% Change
A.S. Biological Science	8	13	11	**-15%**

Please provide any non-transcriptable completion data you have available.

Non-Transcriptable Program	2008-2009	2009-2010	2010-2011	% Change
N/A				

1.2 Department Data

Dimension	2008-2009	2009-2010	2010-2011	% Change
Enrollment	3936	4269	4193	-2%
Productivity (Goal: 546)	666	650	642	-1%
Success	81%	77%	80%	3%
Full-time FTEF	5.1	5.8	5.9	3%
Part-time FTEF	9.9	9.8	10.1	3%
Full-time Staff	7	8	8	0%
Part-time Staff	17	19	19	0%

Department Course Data

	2008-2009			2009-2010			2010-2011		
Course	Enroll.	Prod.	Success	Enroll.	Prod.	Success	Enroll.	Prod.	Success
Biol 1A	199	572	79%	219	519	76%	216	549	90%
Biol 1B	117	582	85%	138	597	86%	154	533	88%
Biol 1C	111	583	90%	133	674	95%	148	580	92%
Biol 1D	0	0	0	19	285	74%	17	255	76%
Biol 8*	34	300	57%	44	380	58%	36	412	65%
Biol 9	21	315	81%	113	848	67%	122	915	84%
Biol 9L	0	0	0	30	603	83%	42	414	98%
Biol 10	696	699	76%	721	656	72%	611	981	73%
Biol 12	92	460	76%	128	640	64%	121	605	70%
Biol 13	68	518	78%	77	626	64%	63	445	72%
Biol 14	179	685	81%	124	767	70%	187	763	70%
Biol 15	15	252	87%	24	404	71%	29	485	79%
Biol 17	28	420	75%	0	0	0	0	0	0
Biol 34H	20	3864	100%	13	386	100%	18	270	61%
Biol 40A	714	780	77%	689	774	75%	697	793	73%
Biol 40B	375	691	86%	600	753	84%	522	631	86%

Biol 40C	430	652	84%	550	709	85%	457	624	88%
Biol 41	346	616	80%	384	523	72%	440	529	81%
Biol 45	231	579	84%	192	489	83%	177	531	84%
Biol 46/58**	132	683	80%	99	743	86%	117	877	86%

* Biology * is a GE nutrition course that is taught every quarter online. We think that these numbers do not accurately reflect the enrollment in this course.
** Biology 46 was changed to Biology 58 as it was not a UC transferable course. We have included the data for 2008-2009 from Biology 46 under Biology 58
***We no longer offer the following courses: Biology 35, Biology 64, Biology 65, Biology 66, Biology 67, Biology 69, Biology 71, Biology 73, Biology78, Biology 85, Biology 90A, Biology 90B, and Biology 190 X. They were last offered in 2008-2009 but were inactivated as they no longer met the required needs of the department.

1.3 Using the data and prompts, provide a short narrative analysis of the following indicators.

1. Enrollment trends over the last three 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.
   Over the last three years: From 2008-2009 to 2009-2010 our enrollment grew 8 % and from 2009-2010 to 2010-2011 our enrollment declined 2%, so over the last three years we have had a net 6% enrollment growth. It is likely that some of the decline in 10-11 was related to the requests from the Administration that we cut classes and sections.
2. Completion Rates (Has the number of degrees/certificates held steady, or increased or declined in the last three years? Please comment on the data and analyze the trends.
   a. AA, AS, transcriptable certificates. **We gave 8 AS degrees in 08-9 and 13 in 09-10 and 11 in 10-11. The majority of students in our program do not get Foothill degrees as they are primarily interested in completing their UC/IGETC transfer requirements.**
   b. Local, non-State approved certificates: **We do not offer these**
   c. Certificates less than 27 units: All certificates less than 27 units should be reviewed carefully to determine if the certificate provides a tangible occupational benefit to the student, such as a job or promotion or higher salary, and documentation should be attached. **We do not offer these**
3. Productivity: The college productivity goal is 546. (Please analyze the productivity trends in your program and explain factors that affect your productivity, i.e. GE students, size restrictions). **Our annual productivity has remained relatively steady over the last three years (666, 650, 642) with a decline of about 1 % each year.**
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	Enrollment went up slightly between 08-09 and 09-10 and down slightly between 09-10 and 10-11. This course is offered F, W, S and includes both day sections and night sections. This course is part of the Biology majors series.
Biol 1B	Enrollment increased steadily over the three years. This course is offered F, W, S and includes both day sections and night sections. For the current year, the department has instituted a prerequisite of Biology 1A to improve student success in the course. This course is part of the Biology majors series.

Biol 1C	Enrollment increased steadily over the three years. This course is offered F, W, S and Su. For the current year, the department has instituted a prerequisite of Biology 1B to improve student success in the course This course is part of the Biology majors series.
Biol 1D	This course is relatively low enrolled each year. We offer it once in the Spring and it has a prerequisite of Biology 1A. The course is required for certain transfer students who are Biology majors.
Biol 8	Enrollment went up slightly between 08-09 and 09-10 and down slightly between 09-10 and 10-11. This course is offered online all four quarters. Demand for Biology 8 was so high this current year (F 2011) that we added an additional section. This is a GE course and helps us to have online GE offerings.
Biol 9	Enrollment increased steadily over the three years. In 08-09 we only offered one section of this course. Over the last two years, we have increased the offerings of this course to both F, W. It is part of our GE offerings and satisfies both the Natural Science GE (when taken with the lab) and the Lifelong Learning GE.
Biol 9L	Enrollment increased steadily over the three years. In 08-09 we only offered one section of this course and it did not fill enough to run. Over the last two years, we have increased the offerings of this course to both F, W. It is part of our GE offerings and satisfies the Natural Science GE (when taken with the lecture).
Biol 10	Enrollment in this course has slightly decreased. We have purposefully slightly reduced the number of annual offerings of this course to help diversify enrollment in other GE Natural Science Biology Courses. This course is offered all four quarters with night sections every quarter as well as sections that meet both early morning and midday.
Biol 12	Enrollment went up between 08-09 and 09-10 and down slightly between 09-10 and 10-11. This course is offered F, W, S and is part of our GE Lifelong Learning options.
Biol 13	Enrollment went up slightly between 08-09 and 09-10 and down between 09-10 and 10-11. This course is offered F and S. It satisfies the Natural Science GE.
Biol 14	Enrollment went down between 08-09 and 09-10 because we reduced the offerings and then increased again from 09-10 to 10-11 because we again offered it all three quarters. We are currently increasing the offerings in this class to include night sections in F and S quarters to diversify our nighttime GE Natural Sciences Offerings.
Biol 15	Enrollment increased steadily over the three years. This course is only offered in the Spring quarter and offers students another GE option. It satisfies the Natural Science GE.
Biol 17	This course was only offered in 08-09. It is an online course but we do not currently have someone to teach the course. It has been inactivated for now.
Biol 34H	Enrollment dropped in 09-10 but rose again in 10-11. We have increased the offerings of this course this academic year to both F and W quarter. We have just changed the number of this course to 54H as the course does not meet UC transferability requirements. We are also thinking of changing the course to higher unit value as most of the other honors program courses are 4-5 units. We will be working on this over the coming year. This course is part of the College Honors program.
Biol 40A	Enrollment has fluctuated slightly over the last three years. The slight drop in 40 A from 08-09 to 09-10 may be due to the Vet Tech program adding a new Anatomy and Physiology course that better meets their student needs. Formerly, VT students took our A&P classes. We offer this course every quarter (FWSSu) and offer sections during the day, evenings and weekends. This course primarily meets the needs of students preparing for Allied Health programs.
Biol 40B	Enrollment has steadily increased in this course going from 375 in 08-09 to 522 in 10-11. We added more sections of this course and scheduled it to meet every quarter to meet the needs of the AH programs, explaining the overall increase in students. We offer this course every quarter (FWSSu) and offer sections during the day, evenings and weekends. This course primarily meets the needs of students preparing for Allied Health programs.
Biol 40C	Enrollment went up in 09-10 and back down in 10-11. We offer this course every quarter (FWSSu) and offer sections during the day, evenings and weekends
Biol 41	Enrollment in this course has steadily increased due to the addition of more sections each year. The decline in productivity is related to the change in the lecture size and the correlated lab size. We used to offer 1.5 lectures with three lab sections. For pedagogical reasons, we decided to only teach lectures with two corresponding lab sections which thereby lowers productivity. We are currently teaching the maximum number of sections of this course due to laboratory space, equipment and financial

	restrictions. We offer this course every quarter (FWSSu) and offer sections during the day and evenings. This course primarily meets the needs of students preparing for Allied Health programs.
Biol 45	Enrollment in this class has declined. Some reasons for this are that it is offered online all three quarters (FWS) and sometimes students are unprepared for online courses. In the2011-2012 school year, we will be offering it both online and face-to-face to see if that makes a difference in the enrollment. This course primarily meets the needs of students preparing for Allied Health programs.
Biol 46/58	Enrollment in this course declined between 08-09 and 09-10 and then increased again in 10-11. We offer this course in F and S in the evening. This class was primarily designed as a prereq. 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 required pre-req. A handful of students taking it for fun and for self interest. Perhaps there are fewer students interested in 09-10 wanting to take it for the latter reasons.

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?
   Yes they are all reviewed consistently and on time.
   b. Comment on program mapping and how it ties to the college Mission(s). For our degree, AS in Biological Sciences, our program is mapped so that students will be prepared to transfer. **The department mission is perfectly aligned with the college mission of basic skills, career preparation, lifelong learning and transfer (see below in 6-8).**
   c. Identify any other programs with which your program has overlap, and comment on the purpose of the overlap. **We do not really have any current overlap with other programs.**
   d. Comment on any recent developments in your discipline which might require modification of existing curriculum and/or the development of new curriculum?
   There have not been significant changes/developments in our discipline other than regular additional discoveries that contribute to content. Many of us are exploring alternative delivery styles to create classroom environments with more active learning.
   e. Do all of the courses in your program have SLOs identified? Do all programs have program-level student learning outcomes? If not, what is your plan for completing these? **Yes all of our courses have Course level SLOs defined and most actively taught courses are assessed and reflected upon every year (we still have a few faculty who are not participating. We also have defined our Program Level SLOs and assessment and will be piloting our assessment program in the 2011-2012 year. Our PL-SLOs are currently based upon assessment only in our AS/majors program. One thing we are considering is how to define the other aspects of our department outside of our degree which contribute higher enrollment numbers and also will also need resources to help them better serve students. Over the last three years, students in our majors series who can potentially earn an AS (most do not as they transfer) have accounted for 11 % of our enrollment. Students who are enrolled in our GE classes (which meet either the Natural Sciences GE and/or the Lifelong Learning GE requirements) account for approximately 30% of our enrollment and the remainder are students engaged in preparation for Allied**

Health programs, which account for approximately 59% of our enrollment. We are considering PL-SLOs tracks but have not come to consensus on this yet.

6. Basic Skills Programs (Please describe your Program's connection to this core mission, if applicable): **Basic skills:** ***While our courses are not specifically designed to address teaching basic skills in math and English, the lack of preparation seen (especially in general education students) requires a significant amount of time spent in office hours, some lecture, and lab teaching remedial math and English skills.***
7. Transfer Programs: Articulation (Please describe your Program's connection to this core mission, if applicable) **Transfer** ***is supported by both our Majors series/AS degree as well as by our GE offerings.***
8. CTE Programs: Labor/Industry Alignment (Please describe your Program's connection to this core mission, if applicable). **Career preparation: our Anatomy and Physiology series and Microbiology and Nutrition classes help prepare students entering Allied Health programs.**

Section 2. Learning Outcomes Assessment Summary

2.1. Attach 2010-2011 Program Level – Four Column Report for PL-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

See attached

2.2 Attach 2010-2011 Course-Level – Four Column Report for CL-SLO Assessment from TracDat

See attached

Section 2 Continued: SLO Assessment and Reflection

2.3 Please provide observations and reflection below.

2.3.a Course-Level SLO

What findings can be gathered from the Course Level Assessments?

For our Biology A.S., the course level student learning outcomes targets for our courses are being met.

What curricular changes or review do the data suggest in order for students to be more successful in completing the program?

For the Biology AS program, there really are no major curricular changes necessary. What we have found is that we need to rewrite assignments to be clearer, and offer more incidents of practice before assessment.

How well do the CL-SLOs reflect the knowledge, skills, and abilities students need in order to succeed in this program?

For our majors, the CL-SLOs are accurately reflecting the requirements for them to transfer successfully to other institutions with a grounded basis in Biology.

How has assessment of course-level student learning outcomes led to improvement in student learning in the program?

For the Biology A.S program, assessment has helped us to focus our classes on what are the most important things for students to know when majoring in biology for potential transfer into 4 year programs. It has also helped us align our teaching better to avoid repetition in the three course series but also to see where emphasis is important for building in the later courses.

2.3.b Program-Level SLO

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

We have not completed any PL-SLO assessments yet. We will be piloting some this academic year

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

We have not completed any PL-SLO assessments yet. We will be piloting some this academic year

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. Continue Departmental reflection on alignment of our major's course for transfer preparation	As our PL-SLOs specifically expect a grounded understanding in the principles of evolution, we need to increase/emphasize the aspects of evolution taught in Bio 1A.	Transfer	This will help students to be better prepared for upper division course work in Biological Sciences when they transfer.
2. We will continue to rewrite and edit our assessments to be as clear as possible for the students.	This really applies to the assessments for all of our CL-SLOs and PL-SLOs.	Transfer	This will help students to be better prepared for upper division course work in Biological Sciences when they transfer.

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.

3.1 Program relation to college mission/core missions

Our degree program serves to meet transfer students. Our anatomy and physiology courses and our GE natural science course help to meet the mission standards of CTE preparation and general education.

3.2 Previous Program Goals from last academic year

Goal	Original Timeline	Actions Taken	Status/Modifications
1. B budget augmentation – 10/11 allotment was $37,000 plus $16,000 lottery. This is still below the $71,000 spent in 08/09 to support our classes; additionally, does not account for maintenance and repair needs of laboratory equipment and any new equipment necessary for new curriculum $20,000 minimum	Ongoing need	None	
2. Purchase 118 microscopes (in 09/10: 0 were purchased)	Ongoing need	None, no microscopes were purchased	We have been asked to offer more Microbiology but will not unless additional comparable microscopes are purchased. In addition, the number of existing working microscopes is declining in those classes that did not get replacements in 08-09
3. Purchase tools and instruments for measuring environmental	Ongoing need	None, no equipment was purchased	

variables (for example, GPS system, soil chemistry kits, water chemistry kits, heat sensor, electrical usage meter)			
Clickers (classroom response system) will allow various active learning/polling strategies to be used in larger classes	Ongoing need	None, no equipment was purchased	
Dedicated Biology Study Center with staffed open lab hours. Stocked with microscopes, anatomical models, prepared slides and other study materials as appropriate.	Ongoing need	None.	
FT Biology Faculty	Ongoing need	None.	
Laboratory Technician Support (minimum 1.5FT – 1FT + 2 PT)	Ongoing need	In the current budget climate, we have had t reduce our part time Lab tech to 16 hrs/week.	We have been approached about adding additional Microbiology sections and will not do so without funding to support more hours for a Lab technician for safety and preparation reasons.
reassigned time for division curriculum reviewer to ensure title V compliance	Ongoing need	None	
Small Greenhouse	Ongoing need	None	
Outdoor Classroom	Ongoing need	There have been discussions with the administration and foundation. A submitted grant for the science learning center includes some funds for initiating the evolution garden.	

3.3 New Goals: Goals can be multi-year

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. Director Reassign time	Ongoing long- term		We are a large department with approximately 120 sections running annually. We have 8 full time faculty and between 15 and 19 part time faculty. Scheduling, organizing, program review, coordinating program learning outcomes and many other tasks take a lot of time and would be very burdensome if no release time was allotted.
2. B budget augmentation 11/12 allotment was $34,501 plus $XXX lottery. This is still below the $71,000 spent in 08/09 to support our classes; additionally, does not account for maintenance and repair needs of laboratory equipment and any new equipment necessary for new curriculum $20,000 minimum.	Ongoing need – long term	I need to talk to John about the current budget. We may have a shortfall this year but he is away.	We use a lot of consumables in our laboratories. We will need to continue purchasing these. In response to budget issues, we are already reducing amounts available in classrooms which limits students access/contact with those supplies.
3. Dedicated Biology Study Center with staffed open lab hours. Stocked with microscopes, anatomical models, prepared slides and other study materials as appropriate.	Ongoing need – long-term		Will give students more access to materials for review and study, increasing their ability to succeed.
4. Laboratory Technician Support (minimum 1.5FT – 1FT + 2 PT)	Ongoing need		There is a lot of preparation involved specifically for the Microbiology classes. Currently our part time lab tech is 16 hours which is not even enough to meet the prep needs of the current Microbiology offerings. If we are to increase these offerings, we would need to increase the hours of our part time lab tech to at least 24 hours/week.
5. Purchase tools and instruments for measuring environmental variables (for example, GPS system, soil chemistry kits, water chemistry kits, heat	Ongoing need- would be one time purchase if funds available.		Tools would expose students to current equipment and technology used in field biology. These would be used in multiple classes including both major's and GE classes.

sensor, electrical usage meter)			
6. Small Greenhouse	Ongoing need		To allow students to complete experiments and also for maintaining an appropriate teaching collection.
7. Clickers (classroom response system) will allow various active learning and polling strategies to be used in larger classes	Ongoing need		Would allow rapid assessment in large classes that would direct changes in teaching strategies.
8. Outdoor Classroom	Ongoing need		Would enhance teaching by exposing students to biological processes outside.
9. FT Biology Faculty	Ongoing need		To maintain staffing levels.
10. reassigned time for division curriculum reviewer to ensure title V compliance	Ongoing need		We really feel that this would be more appropriately funded by the campus due to the extremely heavy workload placed upon the Curriculum Reviewers for the Academic Divisions, especially in the Fall.

Section 4: Program Resources and Support

4.1 Using the tables below, summarize your program's resource requests.

Full Time Faculty and/or Staff Positions

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Laboratory Technician Support (minimum 1.5FT – 1FT + 2 PT)	Increase our part-time lab tech hours by at least 8h/week.	To meet the preparation needs for our laboratories.	
FT Biology Faculty		maintain staffing levels with retirements	

Reassigned Time

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Biology Chair	25%	Maintain smooth operations in Biology Department.	

B Budget Augmentation

B Budget FOAP	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
B-Budget	Increase by at least $10,000	Increase access and exposure to consumable supplies such as dissection materials, tissue slides and models to reduce student competition for those materials within the classrooms.	

Facilities and Equipment

Facilities/Equipment Description	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Microscopes	118@ $2500/each = $300,000	Increase Microbiology offerings and also replace old, poorly functioning scopes in other classrooms.	Measure C
Purchase tools and instruments for measuring environmental	$5000-$10000	Expose students to modern technology used in environmental monitoring and field biology.	

variables (for example, GPS system, soil chemistry kits, water chemistry kits, heat sensor, electrical usage meter)			

One-time/Other: (Release time, training, etc.?

Description	**$ Amount**	**Related Goal from Table in section 3.3**	**Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)**
N/A			

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 have 8 full time faculty and our curriculum is Title 5 compliant	
Weaknesses	We have high demand for both our major's courses and our Allied Health Preparation courses such as Anatomy and Physiology and Micro classes and lack the space and resources to offer more.	
Opportunities	STEM tech program will increase our ability to offer interdisciplinary curricula and enhance our environmental science offerings.	
Threats		State of California Budget issues will limit our ability to offer more courses and grow.

5.2 Are there any critical issues you expect to face in the coming year? How will you address those challenges? **Our department has high need for consumable resources to aid in teaching. We are concerned about the ability to purchase enough of those necessities to adequately meet our teaching needs. For example, in our A&P classes and Biology 1B class, we are potentially reducing the amount of dissection materials due to cost which would limit student access to those materials. Also we have an ongoing and SIGNIFICANT problem with microscopes. We simply do not have adequate microscopes to meet our needs. This is**

particularly acute in our Biology 1C course which is using a very limited number of old microscopes which are of poor quality that increase competition between students trying to review the materials. We will soon also have this problem in some of the A& P classes as they are currently sharing rooms with other classes with adequate microscopes but will be moving next year and will no longer have access. To adequately serve our students we really need to have one microscope/student in every classroom.

We would also like to see more opportunities to develop interdisciplinary offerings particularly for our GE students that would allow students to better understand the application of science to all aspects of their lives and promote critical thinking across disciplines.

We would also like to see more opportunities for professional development to improve active learning and other alternative teaching strategies in our classrooms as well as to help promote more development of interdisciplinary offerings (such as Math and Environmental Biology or English and Biology).

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?

Our program is robust. We have exceeded the college goal for productivity every year for the last three years.

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

Most of the concerns we have are with support from lab technicians (we currently have 1 full time and 1 less than part time lab tech). We also have an ongoing need for materials such as microscopes and a stable budget for purchasing consumables that are necessary for teaching our classes. The purchase of modern, up to date equipment would also help us to better train our students in different fields.

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

We have high productivity. We serve a wide swath of students in meeting their educational goals and the variety of our courses directly meet the college mission for transfer, CTE and general education. Our faculty are active in shared governance at the college and state levels.

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 has committed & excellent faculty & staff. The allied health students are well prepared in the sciences, as evidenced by board exam results. The department has excellent productivity & the faculty are important contributors on college committees.

6.2 Areas of concern, if any:

6.3 Recommendations for improvement:
Increase in funding is important to maintain facilities & equipment, and to expand course offerings in courses such as microbiology – which are over enrolled.

Collaboration with the PSME is essential with the rise of STEM, the interdisciplinary nature of science and the growth of the Science Learning Institute.

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

Phyllis Spragge, Dean 1/6/12

Unit Assessment Report - Four Column

Foothill College

Program (BHS-BIOL) - Biological Sciences AS

Mission Statement: A. Prepare students for a successful career in the biological sciences, including students planning to transfer to a four-year school.
B. Prepare students to be savvy consumers of scientific information, and provide a general education in the life sciences.
C. 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.
D. Support programs in allied health by providing an education in biological principles including anatomy, physiology, microbiology, nutrition and pharmacology.

Primary Core Mission: Workforce

Secondary Core Mission: Transfer

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings	Action & Follow-Up
Program (BHS-BIOL) - Biological Sciences AS - 1 - 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. **Year PL-SLO implemented:** 2010-2011 2011-2012 2012-2013 2013-2014 **PL-SLO Status:** Active	**Assessment Method:** In Biology 1A, students will design and conduct an experiment in groups culminating in a poster presentation. **Assessment Method Type:** Class/Lab Project **Target:** Students can properly phrase a question and a hypothesis, depict their results in graphical format, and draw a conclusion supported by their results.		
	Assessment Method: In Biology 1B, students will design and conduct an experiment on plant nutrition and orally present their results. **Assessment Method Type:** Class/Lab Project		
	Assessment Method: In Biology 1C, students will conduct an experiment in natural selection and present their findings in a written paper. **Assessment Method Type:** Class/Lab Project **Target:** We expect students should have mastery of the process by the end of the course Biology Majors series.		

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings	Action & Follow-Up
Program (BHS-BIOL) - Biological Sciences AS - 2 - Upon successful completion of the biology program, students will be able to apply evolutionary theory at the molecular, cellular, organismal and population levels to explain the unity and diversity of life. **Year PL-SLO implemented:** 2010-2011 2011-2012 2012-2013 2013-2014 **PL-SLO Status:** Active	**Assessment Method:** Students will be given a list of questions at the beginning of Biology 1A related to evolutionary theory at different levels of the biological hierarchy. The questions will be mapped to each of the three courses (as to where the basic information will be covered). At the end of Biology 1C, students will be tested on those questions and are expected to show mastery. **Assessment Method Type:** Exam - Course Test/Quiz **Related Documents:** List of Assessment questions on evolution		

Unit Course Assessment Report - Four Column

Foothill College

Department - Biological Sciences (BIOL)

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded questions on final and lab quizzes. **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. 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 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	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 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 & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		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:** Target Not Met **Year This Assessment Occurred:** 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)) **Assessment Cycles:** 2010-2011 2011-2012	**Assessment Method:** List 5 characteristics of cells - first week of quarter. Revise list - end of quarter. **Assessment Method Type:** Essay/Journal **Target for Success:** 85% of the students will show improved use of vocabulary, depth of response in the "after" list when compared with the "before" list.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
2012-2013 **Course-Level SLO Status:** Active	**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:** Target Met **Year This Assessment Occurred:** 2010-2011	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).
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)) **Assessment Cycles:** 2010-2011	**Assessment Method:** Embedded exam question **Assessment Method Type:** Exam - Course Test/Quiz **Assessment Method:** homework assignment.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
2011-2012 2012-2013 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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 theory of evolution. (Created By Department - Biological Sciences (BIOL)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Question embedded in the final exam. **Assessment Method Type:** Exam - Course Test/Quiz	12/11/2011 - Students were evaluated with 3 multiple choice questions on the final exam and one short answer essay question on the second 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 **Year This Assessment Occurred:** 2010-2011	12/11/2011 - I have changed my lecture slides, to further elaborate 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))	**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	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.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active		point totals would have been higher, if they had a better grasp on how to analyze and present quantitative data. **Result:** Target Met **Year This Assessment Occurred:** 2010-2011	
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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 **Year This Assessment Occurred:** 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) - 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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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	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 **Year This Assessment Occurred:** 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.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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.) **Assessment Method Type:** Exam - Course Test/Quiz	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 **Year This Assessment Occurred:** 2010-2011	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. 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))	**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	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	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

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2011-2012 2012-2013 **Course-Level SLO Status:** Active	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 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 for Success:** 90% of students should be able to do this with a B or better. **Related Documents:** Rubric/Criteria for Field Notebook Biology 15	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:** Target Met **Year This Assessment Occurred:** 2010-2011 **Resource Request:** More field guides, sampling equipment including GPS, plant presses, binoculars, environmental sampling machines.	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.
		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 **Year This Assessment Occurred:** 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	**Assessment Method:** The student will use the information	10/12/2011 - Student do a good job of basic descriptions but they do not really get that they	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	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 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 for Success:** 90% of students will complete the report with a grade of B or higher. **Related Documents:** Rubric/Criteria for Natural History Report 2Biology 15	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 **Year This Assessment Occurred:** 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 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 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)) **Assessment Cycles:** 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** List 5 characteristics of cells. **Assessment Method Type:** Pre/Post Test **Target for Success:** 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.	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.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		Result: Target Met **Year This Assessment Occurred:** 2010-2011	
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)) **Assessment Cycles:** 2011-2012 2012-2013 **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 for Success:** 85% correct.	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 **Year This Assessment Occurred:** 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 given experiment. (Created By Department - Biological Sciences (BIOL)) **Assessment Cycles:** 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**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 ____ 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 for Success:** Average 75% on assignment.	10/22/2011 - Fall 2010 - average 85% Winter 2011 - average 71% Spring 2011 - average 80% Average over 3 quarters - 78.7% **Result:** Target Met **Year This Assessment Occurred:** 2010-2011	
Department - Biological Sciences (BIOL) - BIOL 1A - PRINCIPLES OF CELL BIOLOGY - SLO 4 - Scientific Process - graphs - Students can graph experimental results.	**Assessment Method:** Students will make a graph of their experimental data from any appropriate lab activity.	10/22/2011 - Students are expected to improve their graphing skills over the quarter. Two graphs are used to assess improvement.	10/22/2011 - Students generally do better on graphs when they have to do them manually, rather than by

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
(Created By Department - Biological Sciences (BIOL)) **Assessment Cycles:** 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method Type:** Class/Lab Project **Target for Success:** Average 80% on assignment.	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 **Year This Assessment Occurred:** 2010-2011	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)) **Assessment Cycles:** 2010-2011 **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 for Success:** Average 80% on assignment.		
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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,	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 **Year This Assessment Occurred:** 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 quarter to compare and contrast specific systems in plant versus animal function. The high % of incorrect answers to

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
	and similarities and differences in gametogenesis. Multiple choice questions are typically worth 2-3 points, and essays 5-10 points. **Target for Success:** 80% of students will answer questions correctly (if multiple choice) or receive passing scores (if written responses).		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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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. **Assessment Method Type:** Research Paper **Target for Success:**	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 **Year This Assessment Occurred:** 2010-2011	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
	80% of students receive a passing score on the research paper.		
	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 for Success:** 80% of groups receive passing grades on presentations.		
Department - Biological Sciences (BIOL) - BIOL 1C - EVOLUTION, SYSTEMATICS & 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)) **Assessment Cycles:** 2010-2011	**Assessment Method:** The student will be asked to choose an 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.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
2011-2012 2012-2013 **Course-Level SLO Status:** Active	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 for Success:** 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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**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 conclusions including a explanation of why adaptations might be favored or selected against under different environmental conditions. **Assessment Method Type:** Essay/Journal **Target for Success:** 80% students receive a passing grade on the written report.	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 **Year This Assessment Occurred:** 2010-2011	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 & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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 for Success:** 80% of student groups receive a passing grade on the collection. 80% of individual students receive a passing grade on the phylum essay.	12/11/2011 - Students were able to demonstrate a measurable improvement in their knowledge and 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 **Year This Assessment Occurred:** 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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active			
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 Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Multiple choice exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 90	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 to determine if they understood the relationship between the skeletal system and homeostasis.	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. I asked them to think about what they should see under the

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		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 **Year This Assessment Occurred:** 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.	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. More examples will be necessary in

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
			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. (Created By Department - Biological	**Assessment Method:** Embedded question on an exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:**	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	12/15/2011 - Better slides are needed, more microscopes are needed (to improve the student/microscope ratio) and other models are needed as well.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Sciences (BIOL)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	80% of the class will correctly answer the multiple choice question on the exam.	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 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 **Year This Assessment Occurred:** 2010-2011 **Resource Request:** Slides, microscopes, models	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
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of the class will correctly answer the multiple choice question on the exam.	11/15/2011 - 82% of the class got the question correct (Bio40B Fall 11 JL). **Result:** Target Met **Year This Assessment Occurred:** 2011-2012 **IL-SLO Reflection:** Students successfully used critical thinking skills to analyze a question concerning the cardiovascular system and homeostasis.	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded question on an exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of the class will correctly answer the multiple choice question on the exam.		
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Start Date:** 06/20/2011 **End Date:** 08/18/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Final: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% will answer the question(s) correctly	10/12/2011 - 85% of the students answered this question correctly. **Result:** Target Met **Year This Assessment Occurred:** 2010-2011	10/19/2011 - as the target for success was exceed no changes are needed
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))	**Assessment Method:** final: multiple choice question **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students will answer the question correctly	09/23/2011 - only 63% of the students got this question correct **Result:** Target Not Met **Year This Assessment Occurred:** 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.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active			
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **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 for Success:** 80% of students will answer the test questions correctly	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 ? 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.	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		? 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 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 **Year This Assessment Occurred:** 2010-2011	
	Assessment Method: Written questions answered during in-class activities **Assessment Method Type:** Essay/Journal		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
	Target for Success: 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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam questions **Assessment Method Type:** Exam - Course Test/Quiz	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. ? 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	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 & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		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 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.	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		? 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 **Year This Assessment Occurred:** 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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Embedded exam questions **Assessment Method Type:** Exam - Course Test/Quiz	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 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.	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 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 & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
		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 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 **Year This Assessment Occurred:** 2010-2011	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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)) **Assessment Cycles:** 2011-2012 2012-2013 **Course-Level SLO Status:** Active	**Assessment Method:** Exam **Assessment Method Type:** Exam - Course Test/Quiz	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 **Year This Assessment Occurred:** 2010-2011	12/11/2011 - More demonstration of daily values calculations for diets higher or lower than 2000 kcal.
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)) **Assessment Cycles:** 2011-2012 2012-2013 **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 for Success:** 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 for Success:** 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 **Year This Assessment Occurred:** 2010-2011	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
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 to a potential patient. (Created By Department - Biological Sciences (BIOL)) **Assessment Cycles:** 2011-2012 2012-2013 **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		
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)) **Assessment Cycles:** 2010-2011 **Course-Level SLO Status:** Active	**Assessment Method:** 100 question multiple choice test **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students will score 75% or better		
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))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Course-Level SLO Status: Active			
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013	**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 **Year This Assessment Occurred:** 2010-2011	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.
Course-Level SLO Status: Active			
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)) **Assessment Cycles:** 2010-2011 2011-2012 2012-2013	**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 **Year This Assessment Occurred:** 2010-2011	
Course-Level SLO Status: Active			
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))	**Assessment Method:** Students complete a self-dietary analysis and make written recommendations for appropriate dietary modifications. **Assessment Method Type:** Case Study/Analysis		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Assessment Cycles: 2010-2011 2011-2012 2012-2013 **Course-Level SLO Status:** Active			
Department - Biological Sciences (BIOL) - BIOL 9 - ENVIRONMENTAL BIOLOGY - 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)) **Assessment Cycles:** 2011-2012 2012-2013 **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	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 **Year This Assessment Occurred:** 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.

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	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 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)) **Assessment Cycles:** 2011-2012 2012-2013 **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 **Year This Assessment Occurred:** 2010-2011	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 & Targets for Success / Tasks	Assessment Findings	Reflection/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)) **Assessment Cycles:** 2011-2012 2012-2013 **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 **Year This Assessment Occurred:** 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)) **Assessment Cycles:** 2011-2012 2012-2013 **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	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 **Year This Assessment Occurred:** 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.

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	each then required to write a short opinion 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 for Success:** 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.		
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)) **Assessment Cycles:** 2011-2012 2012-2013 **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 for Success:** 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 **Year This Assessment Occurred:** 2010-2011 **Resource Request:** Tools for environmental quality monitoring.	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.