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Academic Learning Compact : Biology [Effective 2015]

University of South Florida St. Petersburg.

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Academic Learning Compacts: Fall 2015 – Spring 2016

“... to ensure student achievement in undergraduate and graduate degree programs ...”



Academic Learning Compacts BIOLOGY

Fall 2015 – Spring 2016

Due: May 20, 2016

Academic Program-linked College Mission-based Goals/Objectives

In the matrix on the following page, please place an X in the grid that identifies the degree program goals and objectives that align with the institutional mission-based goals/objectives and the College based goals/objectives. These goals/objectives need to be documented in your ALC data.

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UNIVERSITY OF SOUTH FLORIDA ST. PETERSBURG GOALS & OBJECTIVES		COLLEGE OF ARTS & SCIENCES GOALS & OBJECTIVES		UNDERGRADUATE PROGRAMS										
				Anthropology	Biology	Criminology	Literature & Writing	Environmental Science (BA)	Graphic Design	Political Science	Psychology	History	I.S.S.	Journalism (BA)
Academic Performance	Use sustained evidence of SLO's and student achievement for continuous improvement	Initiate and expand graduate programs and develop formal academic ties to other graduate programs within the USF system		X										
	Offer certificate, undergraduate and graduate programs that meet regional needs													
	Implement and support information and instructional technologies that facilitate effective pedagogies			X										
	Enhance programs that specifically support academic excellence			X										
	Increase student awareness of participating in a global society			X										
Student Engagement	Create a freshman experience that enables students to thrive and move successfully through to graduation	Our students will have critical skills and a broad outlook that will make them engaged and productive citizens Incorporate civic engagement, service learning, and experiential learning into their classes, when appropriate												
	Foster institutional pride and strengthen connections within the campus community			X										
	Enhance opportunities for increased student involvement in curricular and co-curricular activities			X										
Diversity & Inclusion	Insure an inclusive community where differences are respected and valued	Cultivate a vigorous liberal arts culture by recruiting talented diverse students, maintaining small class sizes, and mentoring those students we have. Encourage free discussion, foster critical thinking, demand that our students write, and work across disciplines		X										
	Attract and retain a diverse student population			X										
	Increase the diversity of faculty and staff			X										
Research & Creative Activities	Create a vibrant culture of faculty research and creative scholarship	Make significant and meaningful contributions to ongoing dialogues in our academic fields. We expect our undergraduate and graduate students to engage in research in collaboration with faculty		X										
	Promote and support undergraduate research as a meaningful aspect of campus life			X										
	Enhance and support research and scholarly collaborations with community partners			X										

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Signature Page for Academic Program

Academic Program: BIOLOGY

Chair/Coordinator: Melanie Riedinger-Whitmore Date: _____

Summary Statement – Academic Program Performance in Fall 2015 & Spring 2016

Provide a summary statement about academic program performance over the previous year including high points and low points.

Our Biology program continues to grow, and we are the largest major in the college. By the end of the term, we had almost 800 Biology majors. We have a large and diverse student body. We also have a large number of transfer students. Our results are generally positive for the ALCs we were able to measure this past year. As in 2014-2015, our students understand key concepts in biology, they are developing critical thinking and writing skills, and most of our junior/seniors are completing original research projects or internships. Our students are active in student organizations, and community outreach, though it has not been easy for us to collect data on specific activities. Collecting data on trends continues to be somewhat problematic. We streamlined our ALCs and focal courses for 2015-2016 so that we could target data collection to core course experiences. We were not able to measure all of our ALCs last year, for a number of reasons. Though our program is now the largest in the college, we are limited by the number of regular faculty we have (7 regular Biology faculty + 3 visiting professors). Much of our program continues to be delivered by adjuncts or graduate TAs. Some of our ALC goals weren't measured in part because many of our adjuncts weren't informed about the ALCs or the assignments tied to them, because they realized too late that the data was needed, or because they structured assignments in ways that did not lend themselves to data collection for our ALCs. We continue to increase the number of sections of some of our courses we are offering, making it often difficult to coordinate ALC data collection as well as the required lab/lecture exercises, especially when we have many new adjuncts or TAs to train. We will continue to work on this in the coming year to set out requirements before the semester begins. Some of our core courses were coordinated by part-time faculty, who weren't available to participate in departmental dialogues regarding program goals. We will have hired two new faculty for our program, starting Fall 2016, and these new faculty will be teaching key cell courses and actively involved in ALC development. We anticipate that data collection will be more manageable in the coming year. As we approach year 5 for our program, we will begin looking at this data in preparation for program review in coming years.

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Summary Statement – Impact of Changes Made in 2015- 2016

Provide a summary statement about changes that were made in your program as a result of ongoing assessment in the preceding year. Please include both the positive and negative impact of the changes.

In recent years, our students have requested a greater diversity of courses in organismal biology, and in applied fields related to medicine. We added courses on vertebrate zoology, plant taxonomy, and herpetology during the 2015-2016 academic year, and we added a Wild Vertebrates of Florida course in the summer. All courses were well received, and had good enrollment. We tested a new course in Summer – Disease Ecology, that was attractive to students interested in health/pre-med, and are developing that as an online option. Because of student demand for Plants and Human Health, we are developing that as an online option this summer. Last year we began a dialogue about key concepts that we feel – as a department – need to be covered in our introductory courses. That dialogue continues. The goal, in part, is to identify critical concepts that serve as a foundation for our upper-level core courses, and our various concentrations and our minor. Right now, our Bio I and II courses cover a large amount of information, making it difficult for students to assimilate this material, and often to see connections between topics. We hope to streamline content, so that there is more opportunity for dialogue in classes. Course coordinators have been asked to work on refining labs and course topics, and facilitating this dialogue within the department. In spring, we began dialogue with our math faculty to discuss problems our biology students are experiencing in College Algebra and Calculus, and with basic math skills. A working group has developed, and will be working together in the fall to look at strategies to address our students’ math deficiencies, and to help them deal with math phobias and other issues. We also began a discussion in spring about internship and undergraduate research outcomes, and are putting together clearer guidelines for faculty to use in assessing performance in these capstone courses, as well as requirements for students applying for these capstone opportunities. We decided in fall to drop our Scientific Writing course, which was developed for us by another department, and to include the information from that course in core and capstone courses. We dropped this course for several reasons. It relied on one faculty member from another department, who had other teaching commitments, and the only way we could offer this course to cover student demand was to increase enrollment to an unsustainably high level. We have decided to add additional writing assignments in many of our core courses, as well as more time for revision, etc. One challenge that continued during 2015-2016 was that we rely on adjunct or visiting lines for many of our core courses. We have very dedicated adjuncts and visitors, but the reliance on temporary faculty makes it difficult for us to sometimes identify patterns in our ALC data, and to collect data consistently within a course from semester to semester, especially if there is a change in faculty teaching assignments. We are adding two new faculty for fall 2016, and hope that we will be able secure a few other additional lines in upcoming years, and this hopefully help us to be more consistent in collecting data.

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Academic Program: Biology

Person Responsible: Melanie Riedinger-Whitmore, Chairperson, Department of Biological Sciences

Mission of Academic Program (include URL):

The Biology curriculum is designed to provide students with a strong foundation in the Biological Sciences, to introduce students to standard research methods in Biology, and to help them develop critical thinking skills as well as competency in scientific writing and quantitative

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analysis. Our degree prepares students for professional schools (medicine, dentistry, veterinary medicine, pharmacology, physical therapy), graduate programs in the life sciences (botany, animal behavior, cell biology, ecology, zoology, microbiology, marine biology, molecular biology, biomedicine, biotechnology), and other STEM-related fields that require a strong background in Biology. Students majoring in Biology complete core course work in cell biology, ecology, evolution, and genetics, can select elective courses from five areas of emphasis: a) Biomedical Sciences, b) Marine Biology, and c) Ecology and Evolution, d) Plant Biology, and e) General Biology, where students can also tailor their elective course choices to satisfy their individual academic or research interests. Undergraduate research experience is one of the capstone options for this degree, and students are provided many opportunities to work closely with Biology faculty on field or laboratory-based research projects. Internship opportunities, another capstone option, are available for Biology majors through local state and federal government agencies, nonprofit groups, and at biomedical facilities adjacent to the USFSP campus. The mission of our program is to provide our students with a strong foundation in Biology, and the technical and research skills that will allow them to succeed in a wide variety of biological science careers.

<https://www.usfsp.edu/biology/>

List Program Goal(s) / Objective(s):

Program Goals / Objectives must be mapped to College Goals / Objectives – use consistent nomenclature.

[Please note impact of any changes that were made as a result of 2009-10 assessment]

The Biology program began in Fall 2012, and within the first semester attracted over 550 Biology majors. By Fall 2015, the program had more than 760 majors. Since we are truly establishing the foundation for this degree, we have decided to base our goals/objectives on the recent American Association for the Advancement of Science “Vision and Change in Undergraduate Biology Education: A Call to Action - Final Report 2011 (<http://visionandchange.org/files/2011/03/Revised-Vision-and-Change-Final-Report.pdf>; <http://visionandchange.org/>; The goals/objectives recommended by AAAS, and which we follow are:

1. Integrate core concepts and competencies throughout the curriculum

Introduce the scientific process to students early, and integrate it into all undergraduate biology courses. Define learning goals so that they focus on teaching students the core concepts, and align assessments so that they assess the students’ understanding of these concepts. Relate abstract concepts in biology to real-world examples on a regular basis, and make biology concepts relevant by presenting problems in a real-life context. Develop lifelong science-learning competencies. Introduce fewer concepts, but present them in greater depth. Stimulate the curiosity students have for learning about the natural world. Demonstrate both the passion scientists have for their discipline and their delight in sharing their understanding of the world with students.

2. Focus on student-centered learning

Engage students as active participants, not passive recipients, in all undergraduate biology courses. Use multiple modes of instruction in addition to the traditional lecture. Ensure that undergraduate biology courses are active, outcome oriented, inquiry driven, and relevant. Facilitate student learning within a cooperative context. Introduce research experiences as an integral component of biology education

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for all students, regardless of major. Integrate multiple forms of assessment to track student learning. Give students ongoing, frequent, and multiple forms of feedback on their progress. View the assessment of course success as similar to scientific research, centered on the students involved, and apply the assessment data to improve and enhance the learning environment.

3. Promote a campus-wide commitment to change

Mobilize all stakeholders, from students to administrators, to commit to improving the quality of undergraduate biology education. Support the development of a true community of scholars dedicated to advancing the life sciences and the science of teaching. Advocate for increased status, recognition, and rewards for innovation in teaching, student success, and other educational outcomes. Require graduate students in the biological sciences to participate in training in how to teach biology. Provide teaching support and training for all faculty, but especially postdoctoral fellows and early-career faculty, who are in their formative years as teachers.

4. Engage the Biology community in the implementation of change

Promote more concept-oriented undergraduate biology courses, and help all students learn how to integrate facts into conceptual contexts. Ensure that all undergraduates have authentic opportunities to experience the processes, nature, and limits of science. Create active-learning environments for all students, even those in first-year biology courses. Encourage all biologists to move beyond the “depth versus breadth” debate. Less really is more.

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ALC GOALS ESTABLISHED FOR DATA COLLECTION: Fall 2015 & Spring 2016

Academic Program: Biology

Person Responsible: Melanie Riedinger-Whitmore, Chairperson, Department of Biological Sciences

1. Content/Discipline Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2016- Spring 2017
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<p>Demonstrate ability to discuss evolutionary processes and concepts</p>	<p>PCB 4674 - Organic Evolution:</p> <p>In class assignments that requires students to recognize and/or describe evolutionary concepts and processes.</p>	<p>90% of students complete assignments with a minimum grade of 75%.</p>	<p><u>PCB 4674 Fall 2015 Sec 601</u> 88.6% or 91.2% if you do not count the person who did not complete</p> <p><u>PCB 4674 Fall 2015 Sec 604</u> 74.3%</p>	<p>Will continue to work on developing curricular materials that motivate and encourage students to spend time studying the subject; I am always searching for literature that both fosters student interest and that is illustrative of the core concepts of the course. This class has several literature discussion sessions during the course of the semester. Organic Evolution students also receive study reviews and practice exams before each exam. In all cases, we review all practice exams and problems in class before each exam.</p>
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				<p>Will continue to implement current teaching methods</p> <p>Will distribute more homework and on-line supplementary material in order to increase students' understanding/learning</p>
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<p>Ability to discuss the different levels of organismal diversity.</p>	<p>BSC 2011 – Diversity</p> <p>In class assessments relating to taxonomic classification and structural and functional differences that are used to separate organisms into the different classification systems, and the evolutionary history of diversity</p>	<p>90% of students complete assignments with a minimum grade of 75%.</p>	<p><u>Fall 2015</u> I had 47 students in this course, 42 (89.4%) of which received a minimum grade of 75%.</p> <p><u>Spring 2016</u> I had 48 students in this course, 40 of (83%) of which received a minimum grade of 75%.</p>	<p>One of the students listed above did not attend class for the majority of the semester and did not withdraw. Excluding him, this class met the minimum requirements for success, so I will continue to implement the current teaching methods.</p> <p>Two of the students listed above did not attend class for the majority of the semester and did not withdraw. Excluding them, this brings the average to 87.5% of students meeting the criteria, which is just under the goal. I will continue to implement the current teaching methods.</p>
<p>Demonstrate understanding of genetics, and chromosomal and molecular inheritance</p>	<p>PCB 3063 – Genetics</p> <p>Completion of in class assessments on genes, and the processes of inheritance</p>	<p>90% of students complete this assignments with a minimum grade of 75%.</p>	<p>PCB 3063 General Genetics CRN 21956: 70.6%, or 77.4% if you do not count people who did not complete the course</p>	<p>continue to work on developing curricular materials that motivate and encourage students to spend time studying the subject; I have already instituted a policy of reading quizzes before each lecture topic to encourage students to read the chapter before we talk about it in class, and I give homework assignments after each lecture. We also go over practice problems and exams in class and I provide a study review and practice exam before each exam</p>

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			<p>PCB3063.601F15: for combined total score on 6 in-class closed note quizzes 17 of 57 students scored average of 75% or higher (30% of students).</p> <p>PCB3063.602S16: for combined total score on 9 in-class closed note quizzes 27 of 47 students scored average of 75% or higher (57.4% of students).</p>	<p>The quizzes are a small portion of students total course grade vs exams. Future quizzes will allow more opportunity for preparation and interactive instruction on key topics prior to assessment.</p>
Demonstrate understanding of principles of ecology at the population to ecosystem levels	<p>PCB 3043 – Principles of Ecology</p> <p>Completion of in class assignments on key concepts in ecology</p>	90% of students complete assignments with a minimum grade of 75%.	We offered multiple in-class assessments of key principles. > 90% of the students earned A's and B's on these assessments.	We will likely expand in class assessments to include more discussion and group assignments. We are also tailoring topics to provide a greater introduction to applied ecology questions.

*Please include multiple assessments. For example: students perform well on classroom assignments, norm-referenced tests/surveys, and they get accepted to graduate school or are employed.

2. Communication Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2016- Spring 2017
Demonstrate ability to accurately, clearly and succinctly communicate scientific concepts, interpretations and conclusions to peers	<p>BSC XXX – Senior Seminar in Biology</p> <p>Student present oral presentations as part of the seminar course</p>	90% of students complete assignments with a minimum grade of 75%	<p><u>Fall 2015</u> I had 21 students in this course, 20 (95%) of which received a minimum grade of 75%.</p> <p><u>Spring 2016</u> I had 4 students in this course, 4 (100%) of which received a minimum grade of 75%.</p>	<p>I will continue to implement the current teaching methods.</p> <p>I will continue to implement the current teaching methods.</p>

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	<p>BSC 3402L – Experimental Biology lab</p> <p>Students present poster presentation as part of the course</p>	<p>90% of students earn 75% or higher.</p>	<p>Poster presentations are a requirement of the course. All students presented posters, and when possible, most presented posters at the yearly Research Symposium in the spring. 98% of the students presented posters that were given a grade of C or higher.</p>	
	<p>MMC 2110 – Scientific Communication</p> <p>Written assignments assessing ability to communicate science to different audiences</p>	<p>No Data available.</p>	<p>No Data available.</p>	<p>The department voted to phase this course out in Fall 2016. We will be including key content in our core courses, and expanding writing components in some of our electives. We are also determining guidelines for communication requirements for undergraduate research and internship capstone requirements.</p>

3. Critical Thinking Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2016- Spring 2017
Ability to apply the process of science in designing original research	<p>BSC 4910 -Undergraduate Research</p> <p>Students complete original research project that involves determining research question, experimental design, data analysis and</p>	<p>90% of students will complete research project with a satisfactory grade</p>	<p>Undergraduate Research BSC4910 CRN 22007, and she will be receiving an incomplete.</p> <p>BSC4910.602F15: 4 students performed research projects, 4 students completed</p>	<p>No changes anticipated.</p>

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	interpretation		satisfactorily (100%) BSC4910.606S16: 4 students performed research projects, 4 students completed satisfactorily (100%) 100% (n = 53) of students completed a research assignment with an “S” grade. 11 students are co-authors on manuscripts to be submitted for publication in juried journals. HJ- 100% of students completed project with satisfactory grade.	Continue to engage students in research activities. Same process as 2015-2016
	PCB 3043L – Ecology Students complete original research project that involves determining research question, experimental design, data analysis and interpretation	Students complete individual or group research proposal and poster presentation; 90% earning grade of 75% or higher.	> 90% of students completed this with a grade of C or higher.	While this has been a successful assignment, we have found that many students are challenged by writing a proposal and data collection during a short period within a semester. We will be implementing a group project involving the entire class, which each student participating in a portion of the group project. We hope that this might be more focused, and manageable as a class assignment.
Ability to use quantitative reasoning: Apply quantitative analysis to interpret biological data	BSC 3402L – Experimental Biology lab	90% of students complete assignments with a minimum grade of 75%	98% (n = 111) of students completed 15 data analyses and an original research	Continue to engage student in data analysis.

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	Students complete projects that require data analysis and interpretation		poster with a grade greater than 75%. 2 students are now working at medical clinics that require data analysis.	
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4. Civic Engagement

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2016- Spring 2017
Demonstrate engagement with community partners	<p>BSC 4940 – Biology Internship</p> <p>Students will complete internship in the community</p> <p>Active membership in one of our Biology student organizations</p>	<p>90% of students completing internship will have reference letters that are positive and will receive a grade of satisfactory</p> <p>50% of our majors will be a member of a Biology student organization</p>	<p>BSC4940.603F15: 5 students completed internships and 5 students had positive reviews and satisfactorily completed an experience paper (100%)</p> <p>BSC4940.604S16: 3 students completed internships and 3 students had positive reviews and satisfactorily completed an experience paper (100%)</p> <p>100% of students (4) completed an internship for the Florida Fish and Wildlife Research Institute with laudatory comments from the FWRI supervisor. 100% received “S”.</p> <p>HJ- 100% of students completed project with satisfactory grade.</p> <p>Section 607 I also had two Biology Internship students during Spring of 2016. One received</p>	<p>The program will continue, although gradually the Career Center will become more involved with internships.</p> <p>Continue to assign students to the FWRI as well as local health and medical facilities.</p> <p>Same process as 2015-2016</p>

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			<p>an S and the other received an I because she was unable to be scheduled for enough hours during the Spring semester. She is continuing the hours in the summer months and will be given an S once she meets the number of hour requirements. Both have excelled in these roles and kept a daily diary of their tasks during the course of the internship. They will both have reference letters as a result of this experience.</p>	
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5. Multiculturalism / Diversity

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2016- Spring 2017
Ability to understand the relationship between science and society: Identify social and historical dimensions of biology practice	<p>BSC XXXX – Senior Seminar in Biology</p> <p>Students present essays that address relationship between science and society</p>	90% of students complete assignments with a minimum grade of 75%	Not Assessed	<p>N/A</p> <p>We will be determining other courses in which this goal/objective might be most appropriate.</p>

ALC GOALS ESTABLISHED FOR DATA COLLECTION: Fall 2016 & Spring 2017

Academic Program: Biology

Person Responsible: Melanie Riedinger-Whitmore

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1. Content/Discipline Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Demonstrate ability to discuss evolutionary processes and concepts	<p>PCB 4674 - Organic Evolution:</p> <p>In class assignments that requires students to recognize and/or describe evolutionary concepts and processes</p>	90% of students complete assignments with a minimum grade of 75%.		
Demonstrate understanding of cell structure, function of cell components, and cellular processes.	<p>BSC 2010 – Bio I – Cell Processes</p> <p>In class assignments that requires students to identify components of the cell and the function of these components, and/or to describe key cellular processes</p> <p>PCB 3023 – Cell Biology</p> <p>In class assignments that requires students to discuss cellular features and processes at an advanced level.</p>	90% of students complete assignments with a minimum grade of 75%.		
Ability to discuss the different levels of organismal diversity.	<p>BSC 2011 – Diversity</p> <p>In class assessments relating to taxonomic classification and structural and functional differences that are used to separate organisms into the different classification systems, and the evolutionary history of diversity</p>	90% of students complete assignments with a minimum grade of 75%.		

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Demonstrate understanding of genetics, and chromosomal and molecular inheritance	PCB 3063 – Genetics Completion of in class assessments on genes, and the processes of inheritance	90% of students complete this assignments with a minimum grade of 75%.		
Demonstrate understanding of principles of ecology at the population to ecosystem levels	PCB 3043 – Principles of Ecology Completion of in class assignments on key concepts in ecology	90% of students complete assignments with a minimum grade of 75%.		

*Please include multiple assessments. For example: students perform well on classroom assignments, norm-referenced tests/surveys, and they get accepted to graduate school or are employed.

2. Communication Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Demonstrate ability to accurately, clearly and succinctly communicate scientific concepts, interpretations and conclusions to peers	BSC XXX – Senior Seminar in Biology Student present oral presentations as part of the seminar course BSC 3402L – Experimental Biology lab Students present poster presentation as part of the course	90% of students complete assignments with a minimum grade of 75% 90% of students earn 75% or higher.		

3. Critical Thinking Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in
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“... to ensure student achievement in undergraduate and graduate degree programs ...”

				Fall 2017 & Spring 2018
Ability to apply the process of science in designing original research	BSC 4910 -Undergraduate Research Students complete original research project that involves determining research question, experimental design, data analysis and interpretation	90% of students will complete research project with a satisfactory grade		
	PCB 3043L – Ecology Students complete original research project as part of class that involves determining research question(s), experimental design, data analysis and interpretation	Students complete or group research poster presentation; 90% earning grade of 75% or higher.		
Ability to use quantitative reasoning: Apply quantitative analysis to interpret biological data	BSC 3402L – Experimental Biology lab Students complete projects that require data analysis and interpretation	90% of students complete assignments with a minimum grade of 75%		

4. Civic Engagement

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
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Demonstrate engagement with community partners	<p>BSC 4940 – Biology Internship</p> <p>Students will complete internship in the community</p> <p>Active membership in one of our Biology student organizations</p>	<p>90% of students completing internship will have reference letters that are positive and will receive a grade of satisfactory</p> <p>50% of our majors will be a member of a Biology student organization</p>		
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5. Multiculturalism / Diversity

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Ability to understand the relationship between science and society: Identify social and historical dimensions of biology practice	<p>BSC XXXX – Senior Seminar in Biology</p> <p>Students present essays that address relationship between science and society</p>	90% of students complete assignments with a minimum grade of 75%		