

Florida Gulf Coast University
 College of Arts & Sciences
Biology Program
Integrated Program Matrix
Synthesis & Revision – March 2009

University and Program Learning Goals and Outcomes	Program Assessment Plan and Criteria	Use of Assessment Results for Continuous Program Improvement 2005-06 (Due February 06)	Use of Assessment Results for Continuous Program Improvement 2006-07 (Due February 07)	Use of Assessment Results for Continuous Program Improvement 2008-09 (Due February 09)
<p><u>Aesthetic Sensibility</u> (University Level)</p> <p>A. Know and understand the variety of aesthetic frameworks</p> <p>B. Analyze and evaluate aesthetic principles at work</p> <p>C. Collaborate in projects involving aesthetic awareness and/or analysis</p> <p><u>Aesthetic Sensibility</u> (Program Level)</p> <p>All B.A. Biology students will:</p> <p>1. Recognize the unifying framework that evolution provides for all aspects of Biological Sciences.</p> <p>2. Understand the increasing complexity and interconnectedness of living organisms from atoms, to cells and thence organisms to ecosystems. (Academic Learning Compact 1.1)</p>	<p><u>Plan:</u> Direct Assessment – Faculty will review student performance on identified assignments and exams in BSC XXXX Integrative Biology (3 hours). This capstone course for the B.A. Biology program provides students the opportunity for reflection on their educational experience, application of mastered skills and knowledge, and connections to human society. Identified assignments and exams will be reviewed using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Students will be rated Exemplary, Satisfactory, or Developing.</p> <p>Indirect Assessment: Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p><u>Criteria:</u> Successful achievement of the Aesthetic Sensibility Goal will require that the mean level of student achievement be at least Satisfactory for direct measures of achieving the aesthetic sensibility goal and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The committee's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>			

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<p><u>Culturally Diverse Perspective</u> (University Level)</p> <p>A. Know and understand diversity in local/global communities</p> <p>B. Analyze and evaluate the impact of cultural differences</p> <p>C. Participate in projects involving interaction with diverse people, ideas, & values</p> <p><u>Culturally Diverse Perspective</u> (Program Level)</p> <p>Biology B.A. students will</p> <p>1. Understand the role of diversity in maintaining healthy and stable ecosystems.</p> <p>2. Solve problems in group settings incorporating diverse perspectives and approaches.</p> <p>3. Understand the role of the scientific method as a tool enabling individuals with culturally diverse backgrounds to solve common problems.</p>	<p><u>Plan:</u> Direct Assessment – Faculty will review student performance on identified assignments and exams in BSC XXXX Integrative Biology (3 hours). This capstone course for the B.A. Biology program provides students the opportunity for reflection on their educational experience, application of mastered skills and knowledge, and connections to human society. Identified assignments and exams will be reviewed using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Students will be rated Exemplary, Satisfactory, or Developing.</p> <p>Indirect Assessment: Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p>In addition, a survey will be administered to Faculty teaching Biology courses in the B.A. to determine the extent to which students are required to work in group settings that emphasize diversity.</p> <p><u>Criteria:</u> Successful achievement of the Culturally Diverse Perspective Outcome will require that the mean level of student achievement be at least Satisfactory for direct measures of achieving the cultural diversity goal and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p>Results of the faculty survey will be used to identify the extent to which students are engaged in cooperative learning in diverse settings and the types of cooperative learning that are used.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The committee's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>			

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<p><u>Ecological Perspective</u> (University Level)</p> <p>A. Know issues of ecological/economic sustainability</p> <p>B. Analyze and evaluate local & global ecological issues</p> <p>C. Participate in ecological/environmental projects</p> <p><u>Ecological Perspective</u> (Program Level)</p> <p>This outcome is covered by student participation in the university required course IDS 3920 Colloquium</p>	<p>The University Quality Enhancement Plan provides an assessment strategy to determine student success in developing an ecological perspective.</p> <p>Feedback from the QEP direct and indirect assessment strategies will be used to determine student success at FGCU in the development of an ecological perspective. These results will be used to develop appropriate changes in our program.</p>	<p><u>Direct Assessment:</u> Instruments have included a Summary Response assignment based on an ecological issue or perspective that stresses critical thinking and writing. The goal was for a 1point improvement in overall scores (on a 6 point scale) from students in Composition I (8% assessed) and Connections (20% assessed) moving from the lower range (1-2) to the middle range (3-4). Students in Liberal Studies Capstone (69% assessed) course were also given the instrument, with a 1 point improvement (upper range of 5-6) expected in their average score over and above that of Connections. The goal for Composition I was exceeded, with average scores at 2.7. The goal for Connections course students was met, with average scores in the middle range (3.31). The Capstone course goal was not met, with scores at 3.95 (native students scoring 4.0 and upper level transfers scoring 3.91). Final results suggest that students in the Connections class are achieving the level desired. However, those completing the Liberal Studies degree and Capstone course had lower than expected results, perhaps due to lack of abilities in critical thinking, writing, or in knowledge of ecological issues. Overall inter-rater reliability was at 86%.</p> <p><u>Indirect Assessment:</u> Students in the Connections class took a survey relating to their knowledge of ecological perspective and responded on a Likert Scale of 1-5 (5 being the highest); an overall average score of 4 was expected for all students. Average scores were below the expected 4.0 level. Students scored their understanding of the program's overall goals at 3.83; their understanding of ecological perspective importance at 3.62; and their understanding of Community Involvement and Awareness at 3.75. Students that completed both the on campus workshop and community service project exceeded the 4.0 expected level, those who completed only one or the other did not.</p> <p><u>Plans for Continuous Improvement:</u> No immediate changes are planned for the Composition I class, although this class might become a site for advancing ecological literacy in the future. In Connections, the ecological literacy program (Wings of Hope) has been streamlined to be introduced slightly later in the semester. A detailed assignment sheet has been developed, providing instructors and students a clear indication of what the program entails along with a clear grading rubric detailing how students will be graded. In addition, the number of Wings of Hope programs in the spring semester have been reduced so that several Connections sections will not have a designated service learning activity; students in these sections will need to work towards developing their own activity. Finally, no immediate changes were proposed for the upper level courses until feedback has been gathered from the QEP assessment.</p>		

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<p><u>Effective Communication</u> (University Level)</p> <p>A. Know principles for effective communication</p> <p>B. Organize thoughts and compose ideas</p> <p>C. Participate in collaborative communication projects</p> <p><u>Effective Communication</u> (Program Level)</p> <p>Upon completion of the degree program, students will demonstrate the ability to:</p> <p>1. Effectively communicate using appropriate scientific terminology as individuals and as team members by listening, speaking, and writing. (Academic Learning Compact 1.3)</p>	<p><u>Plan:</u> Direct Assessment--Faculty will review student proposals and oral presentations prepared as part of the Scientific Process (ISC 3120) course using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Numerical scores from 1 to 5 were used where 5 = excellent, 4 = Very Good, 3 = Good, 2 = Fair, and 1 = Poor.</p> <p>Indirect Assessment: Students will complete a survey that will allow them to self-assess their communication skills on their proposals and presentations.</p> <p>In addition, a survey will be administered to faculty teaching Biology courses in the B.A. to determine the extent to which students are meeting the Effective Communication outcome.</p> <p><u>Criteria:</u> Successful achievement of the Effective Communication Outcome will require that the mean level of student achievement be at least 3 (Good) for direct measures and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p>Results of the faculty survey will be used to identify the extent to which students are engaged in cooperative learning and the types of cooperative learning that are used.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The team's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>		<p><u>Direct Assessment:</u> ISC 3120 Scientific Process provides students the beginning of the scientific process and assessed by evaluators of the course final proposal. Of 22 students evaluated, scores averaged at 3 points (out of 5) with the lowest at 2.3 and highest at 4.3—across 8 different criteria. A written research proposal and presentation (oral and by poster) are evaluated by faculty and outside evaluators using a detailed rubric. The mean score for research projects from 19 students was 95. The mean score for research poster/presentations from 16 students was 89.</p> <p><u>Plans for Continuous Improvement:</u> The results of the evaluation of ISC 3120 Scientific Process revealed a weakness in how well the proposal demonstrated an awareness or use of statistical techniques, simulation models, or a system approach. As a result, senior research presentation BSC 4911 and project BSC 4910 were reorganized into significant courses with syllabi, course objectives, discussions, working seminars in Fall 2005, in order to facilitate consistency in experience for students during their senior year. This has been effective and is demonstrated in the level of research and presentation exhibited in the assessment for this year. Students who do not finish research in one semester and take an incomplete are proof that some research is more labor intensive, causing delays in receiving reagents as well as other setbacks. Also noteworthy is that some students excel in presenting their poster in a smaller discussion rather than with a large group. Emphasis on student scientific writing and approach to statistical analysis will also be a part of the improvement plan for future semesters.</p>	

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<p><u>Ethical Responsibility</u> (University Level)</p> <p>A. Know and understand ethical issues</p> <p>B. Analyze and evaluate ethical issues in a variety of contexts</p> <p>C. Participate in collaborative projects involving ethical analysis and/or decisions</p> <p><u>Ethical Responsibility</u> (Program Level)</p> <p>Upon completion of the degree program, students will demonstrate the ability to:</p> <p>1. Apply ethical practices and behavior in all aspects of biology scientific endeavors (Academic Learning Compact 1.4)</p> <p>2. Demonstrate understanding of ethical issues in biology.</p>	<p><u>Plan</u>: Direct Assessment -- Faculty will review student performance on identified assignments and exams in BSC XXXX Integrative Biology (3 hours). This capstone course for the B.A. Biology program provides students the opportunity for reflection on their educational experience, application of mastered skills and knowledge, and connections to human society. Identified assignments and exams will be reviewed using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Students will be rated Exemplary, Satisfactory, Developing, or not rated.</p> <p>Indirect Assessment--Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p><u>Criteria</u>: Successful achievement of the Ethical Responsibility Goal will require that the mean level of student achievement be at least Satisfactory for direct measures and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p><u>Use of Results</u>: A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The team's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>			

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<p><u>Information Literacy</u> (University Level)</p> <p>A. Identify and locate sources of information</p> <p>B. Analyze and evaluate information in a variety of contexts</p> <p>C. Participate in collaborative analysis/application of information</p> <p><u>Information Literacy</u> (Program Level)</p> <p>Upon completion of the degree program, students will be able to:</p> <p>1. Engage in the scientific process to form hypotheses, synthesize scientific information, gather and analyze data, and conduct appropriate statistical analyses. (Academic Learning Compact 1.2)</p> <p>2. Approach and solve biological problems using appropriate scientific literature, organizing and evaluating information, and engaging in effective critical thinking skills in both individual and group settings. (Academic Learning Compact 1.5)</p>	<p><u>Plan:</u> Direct Assessment--Faculty will review student proposals and oral presentations prepared as part of the Scientific Process (ISC 3120) course using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Numerical scores from 1 to 5 were used where 5 = excellent, 4 = Very Good, 3 = Good, 2 = Fair, and 1 = Poor.</p> <p>Indirect Assessment--Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p><u>Criteria:</u> Successful achievement of the Information Literacy Outcomes will require that the mean level of student achievement be at least 3 (Good) for direct measures and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The team's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>		<p><u>Direct Assessment:</u> ISC 3120 Scientific Process provides students the beginning of the scientific process and assessed by evaluators of the course final proposal. Of 22 students evaluated, scores averaged at 3 points (out of 5) with the lowest at 2.3 and highest at 4.3—across 8 different criteria. BSC 4911 and BSC 4910 Senior Research Project and Presentation in Biology are culminating courses for this program's goal and the capstone of learning experiences for the baccalaureate degree in Biology. A written research proposal and presentation (oral and by poster) are evaluated by faculty and outside evaluators. In addition faculty mentors provide signature of final research completion as acceptance of mastery of objectives. The mean score for research projects from 19 students was 95. The mean score for research poster/presentations from 16 students was 89.</p> <p><u>Plans for Continuous Improvement:</u> The results of the evaluation of ISC 3120 Scientific Process revealed a weakness in how well the proposal demonstrated an awareness or use of statistical techniques, simulation models, or a system approach. Senior research presentation BSC 4911 and project BSC 4910 were reorganized into significant courses with syllabi, course objectives, discussions, working seminars in Fall 2005, in order to facilitate consistency in experience for students during their senior year. This has been effective and is demonstrated in the level of research and presentation exhibited. Students who do not finish research in one semester and take an incomplete, are proof that some research is more labor intensive, causing delays in receiving reagents as well as other setbacks. Also noteworthy is that some students excel in presenting their poster in a smaller discussion rather than with a large group. Emphasis on student scientific writing and approach to statistical analysis will also be a part of the improvement plan for future semesters.</p>	

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<p><u>Problem-Solving Abilities</u> (University Level)</p> <p>A. Understand multi/interdisciplinary nature of knowledge</p> <p>B. Apply critical, analytical creative and systems thinking</p> <p>C. Work individually and collaboratively to recognize and solve problems</p> <p><u>Critical Thinking and Problem-Solving Abilities</u> (Program Level)</p> <p>Upon completion of the degree program, students will be able to:</p> <p>1. Engage in the scientific process to form hypotheses, synthesize scientific information, gather and analyze data, and conduct appropriate statistical analysis (Academic Learning Compact 1.2)</p> <p>2. Approach and solve biological problems using appropriate scientific literature, organizing and evaluating information and engaging in effective critical thinking skills in both individual and group settings. (Academic Learning Compact 1.5)</p>	<p><u>Plan:</u> Direct Assessment--Faculty will review student proposals and oral presentations prepared as part of the Scientific Process (ISC 3120) course using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Numerical scores from 1 to 5 were used where 5 = excellent, 4 = Very Good, 3 = Good, 2 = Fair, and 1 = Poor.</p> <p>Faculty will review student performance on identified assignments and exams in BSC XXXX Integrative Biology (3 hours). This capstone course for the B.A. Biology program provides students the opportunity for reflection on their educational experience, application of mastered skills and knowledge, and connections to human society. Identified assignments and exams will be reviewed using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Students will be rated Exemplary, Satisfactory, Developing, or not rated.</p> <p>Indirect Assessment--Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p><u>Criteria:</u> Successful achievement of the Problem Solving Outcomes will require that the mean level of student achievement be at least 3 (Good) in the assessment conducted in Scientific Process and at least 2 (Satisfactory) for the assessment in Integrative Biology, both of which provide direct measures, and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The committee's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>		<p><u>Direct Assessment:</u> ISC 3120 Scientific Process provides students the beginning of the scientific process and assessed by evaluators of the course final proposal. Of 22 students evaluated, scores averaged at 3 points (out of 5) with the lowest at 2.3 and highest at 4.3—across 8 different criteria. BSC 4911 and BSC 4910 Senior Research Project and Presentation in Biology are culminating courses for this program's goal and the capstone of learning experiences for the baccalaureate degree in Biology. A written research proposal and presentation (oral and by poster) are evaluated by faculty and outside evaluators. In addition faculty mentors provide signature of final research completion as acceptance of mastery of objectives. The mean score for research projects from 19 students was 95. The mean score for research poster/presentations from 16 students was 89.</p> <p><u>Plans for Continuous Improvement:</u> The results of the evaluation of ISC 3120 Scientific Process revealed a weakness in how well the proposal demonstrated an awareness or use of statistical techniques, simulation models, or a system approach. Senior research presentation BSC 4911 and project BSC 4910 were reorganized into significant courses with syllabi, course objectives, discussions, working seminars in Fall 2005, in order to facilitate consistency in experience for students during their senior year. This has been effective and is demonstrated in the level of research and presentation exhibited. Students who do not finish research in one semester and take an incomplete, are proof that some research is more labor intensive, causing delays in receiving reagents as well as other setbacks. Also noteworthy is that some students excel in presenting their poster in a smaller discussion rather than with a large group. Emphasis on student scientific writing and approach to statistical analysis will also be a part of the improvement plan for future semesters.</p>	

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<p><u>Technological Literacy</u> (University Level)</p> <p>A. Develop knowledge of modern technology</p> <p>B. Process information through use of technology</p> <p>C. Collaborate with others using technology tools</p> <p><u>Technological Literacy</u> (Program Level)</p> <p>Upon completion of the degree program, students will be able to:</p> <p>1. Use discipline appropriate technology and techniques to conduct scientific research</p> <p>2. Demonstrate proficiency in using appropriate technologies to access, organize, and present scientific information.</p>	<p><u>Plan:</u> Direct Assessment--Faculty will review student proposals and oral presentations prepared as part of the Scientific Process (ISC 3120) course using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Numerical scores from 1 to 5 were used where 5 = excellent, 4 = Very Good, 3 = Good, 2 = Fair, and 1 = Poor.</p> <p>Indirect Assessment--Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p>We will also conduct a survey of faculty to identify specific tools and technologies used in courses within the program.</p> <p><u>Criteria:</u> Successful achievement of the Technological Literacy Goals will require that the mean level of student achievement be at least Satisfactory for direct measures and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p>Results from faculty survey will be used to assess success in providing opportunities for students to use technology specific to the discipline and to identify weaknesses within the program.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The committee's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program</p>			

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<p><u>Community Awareness and Involvement</u> (University Level)</p> <p>A. Know and understand relationships between individuals and their communities</p> <p>B. Analyze, evaluate and assess human needs and practices</p> <p>C. Participate collaboratively in community service projects</p> <p><u>Community Awareness and Involvement</u> (Program Level)</p> <p>Upon completion of the degree program, students will be able to:</p> <p>1. Relate their specific discipline to improving communities.</p>	<p><u>Direct Assessment:</u> Faculty will review student performance on identified assignments and exams in BSC XXXX Integrative Biology (3 hours). This capstone course for the B.A. Biology program provides students the opportunity for reflection on their educational experience, application of mastered skills and knowledge, and connections to human society. Identified assignments and exams will be reviewed using a faculty-developed rubric that assesses student progress in attaining mastery of program goals. Students will be rated Exemplary, Satisfactory, or Developing.</p> <p><u>Indirect Assessment:</u> Faculty developed items on the Senior Student Survey serve as an indirect measure of the extent to which the program is meeting this goal.</p> <p><u>Criteria:</u> Successful achievement of the Community Awareness outcomes will require that the mean level of student achievement be at least Satisfactory for direct measures of achieving the community awareness goal and at least 2 on the indirect assessment where 1 is Strongly Agree, 2 is Agree, 3 is Disagree, and 4 is Strongly Disagree.</p> <p><u>Use of Results:</u> A departmental team will be appointed to examine the results of these assessments and draft a summary of the program's strengths and weaknesses. The team will present these findings to the department. The committee's report will be discussed and possible amendments made before final approval. The B.A. Biology program will implement agreed upon strategies for improving the program.</p>			