

Florida Gulf Coast University
 College of Arts and Sciences
Biotechnology Program
Integrated Program Matrix
Synthesis & Revision – May 2008

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 2007-08 (Due February 08)
<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>Biotechnology students will be able to incorporate the interaction between science and society in their lives. Upon completion of the degree program, students will be able to engage in aesthetic frameworks and principles and collaborate in projects involving aesthetic awareness and/or analyses. (IDS 3300, IDS 3301, IDS 3303, PCB3023C, PCB 3063C, MCB 3020C)</p> <p>Note: Learning outcomes must be revised so that they are measurable and describe student learning.</p>	<p>Program assessment involves the successful completion of the course objectives required within the degree program. Examinations, presentations, and projects are assessment tools used in the courses IDS 3300, IDS 3301, IDS 3303, PCB3023C, PCB 3063C, MCB 3020C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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>Upon completion of the degree program, students will be able to:</p> <ul style="list-style-type: none"> Approach and solve biological problems critically with scientific literacy in individual and group settings and incorporate a diversity of ideas and approaches (Academic Learning Compact 1.4) (IDS 3301, IDS 3303, PCB3023C, PCB 3063C, MCB 3020C) 	<p>Program assessment involves the successful completion of the coursework required within the degree program. Examinations, presentations, and projects are assessment tools used in the courses IDS 3301, IDS 3303, PCB3023C, PCB 3063C, MCB 3020C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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 meeting the learning goal of an Ecological Perspective.</p> <p>Ecological Perspective goal assessment by the QEP will be used to determine student success at FGCU in the development of an ecological perspective; changes derived from this analysis will be used to revise the course in question.</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 be able to:</p> <ul style="list-style-type: none"> Engage in effective scientific communication as individuals and as team members by listening, speaking, and writing and presenting in oral and poster format (Academic Learning Compact 1.3) (BSC 4943) 	<p>Program assessment involves the successful completion of the coursework required within the degree program. Oral and/or poster presentations of senior research projects are assessment tools used in the course BSC 4943.</p> <p>The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Assessment rubrics for the course are used to evaluate mastery of the course objectives. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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 6 students evaluated, scores averaged at 3.8 points (out of 5) with the lowest at 2.8 and highest at 4.3—across 8 different criteria. Senior Research Project (BSC 4942C) and Presentation BSC 4943 in Biology is a culminating course for this program 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 using a detailed rubric. The mean score for research projects from 7 students was 96. The mean score for research poster/presentations from 7 students was 86.</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 4943 and project BSC 4942C 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 be able to:</p> <ul style="list-style-type: none"> • Apply ethical practices and behavior in all aspects of biotechnology scientific endeavors • Demonstrate the ethical aspects of science, their conduct as a scientist, and their conduct as a citizen (BSC 4942C) 	<p>Program assessment involves the successful completion of the coursework required within the degree program. Successful completion of a senior research project is the assessment tool used in the course BSC 4942C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Assessment rubrics for the course are used to evaluate mastery of the course objectives. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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> <ul style="list-style-type: none"> Engage in the scientific process to form hypotheses, synthesize scientific information, gather and analyze data, apply statistical techniques and draw conclusions (Academic Learning Compact 1.2) (BSC 4942C, BSC 4943, ISC 33120C) <p>Note: This learning outcome needs to be refined to focus on Information Literacy.</p>	<p>Program assessment involves the successful completion of the coursework required within the degree program. Successful completion of a research proposal, senior research project, and research presentation are the assessment tool used in the courses BSC 4942C, BSC 4943, ISC 3120C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Assessment rubrics for the course are used to evaluate mastery of the course objectives. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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 6 students evaluated, scores averaged at 3.8 points (out of 5) with the lowest at 2.8 and highest at 4.3—across 8 different criteria. BSC 4942C Senior Research Project and BSC 4943 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 7 students was 96. The mean score for research poster/presentations from 7 students was 86.</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 4943 and project BSC 4942C 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> <ul style="list-style-type: none"> Engage in the scientific process to form hypotheses, synthesize scientific information, gather and analyze data, apply statistical techniques and draw conclusions (Academic Learning Compact 1.2) Approach and solve biological problems critically with scientific literacy in individual and group settings (Academic Learning Compact 1.4) Demonstrate ability to perform molecular, cellular, and biochemical techniques used in biotechnology (Academic Learning Compact 1.5) (BSC 4942C, BSC 4943, ISC 33120C) 	<p>Program assessment involves the successful completion of the coursework required within the degree program. Successful completion of a research proposal, senior research project, and research presentation are the assessment tool used in the courses BSC 4942C, BSC 4943, ISC 33120C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Assessment rubrics for the course are used to evaluate mastery of the course objectives. Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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 6 students evaluated, scores averaged at 3.8 points (out of 5) with the lowest at 2.8 and highest at 4.3—across 8 different criteria. BSC 4942C Senior Research Project and BSC 4943 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 7 students was 96. The mean score for research poster/presentations from 7 students was 86.</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 4943 and project BSC 4942C 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> <ul style="list-style-type: none"> Engage in the scientific process to form hypotheses, synthesize scientific information, gather and analyze data, apply statistical techniques and draw conclusions (Academic Learning Compact 1.2) (BSC 4942C, BSC 4943, ISC 33120C) <p>Note: This learning outcome needs to be refined to focus on Technological Literacy.</p>	<p>Program assessment involves the successful completion of the coursework required within the degree program. Successful completion of a research proposal, senior research project, and research presentation are the assessment tool used in the courses BSC 4942C, BSC 4943, ISC 33120C. The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Assessment rubrics for the course are used to evaluate mastery of the course objectives.</p> <p>Indirect measurements include SUSSAI evaluations. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</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>Note: Need to develop learning outcomes for Community Awareness.</p>	<p>Program assessment involves the successful completion of the coursework required within the degree program. Examinations, presentations, and projects are assessment tools used in the courses BSC 1010C, BSC 1011C, PCB 3923C, PCB 3063C, PCB4522C.</p> <p>The criteria for assessment is the success rate of 70% of students mastering course objectives in the core courses. Successful completion of service learning activities is used for assessment. If evaluations are negative or less than 2.5 in each area, a review of the course content will be conducted.</p> <p>Note: Program assessment cannot be based on completion of course objectives. For all assessment plans that state this, please revise and create a program assessment plan.</p>			