**Biological Sciences**

**Majors:** Biology, Biochemistry and Molecular Biology (biology portion), Human Biology, Physiological Sciences  
**Degree:** B.S.  
**Date Submitted:** April 28, 2006

<table>
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<tr>
<th>Program Learning Outcomes</th>
<th>Performance Indicators</th>
<th>Measures</th>
<th>Use of the Information</th>
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<tr>
<td>Students will be able to:</td>
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<td>The Biological Sciences Undergraduate Committee will collect and review the results from these key courses each year and prepare a report for the entire faculty that will be presented at a faculty meeting for discussion.</td>
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| 1. Demonstrate a breadth of knowledge in biology, with a deeper understanding in specific areas of interest | A. Appreciation for the diversity of organisms, their systematics and phylogeny, and their ecological interactions.  
B. Understanding of the major themes of biochemistry including protein structure and function, carbohydrate and lipid metabolism in relation to energy production, and protein and nucleic acids and the nature of the genetic code.  
C. Understanding of how genetic information is translated for organism function, how it passes to the next generation, and how it is modified over time and the impact of this on evolution *(not physiological science majors)*.  
D. Understanding of basic concepts and scientific evidence that underlie key cellular processes: membrane function, signal | A. Instructors in **BIOL 001 and 002** will be asked to identify 10 questions on exams that relate to this Performance Indicator and will report results to Undergraduate Committee. This is a broad Performance Indicator because not all students in the class will be Biology majors. Because these are multiple choice questions, reports should simply indicate number correct, number wrong for each question.  
B. Instructors in **BIOL 100 (Biochemistry and the Molecular Basis of Biology)** will identify 3 key questions from exams (preferably the final exam) that address this Performance Indicator and report results to the Undergraduate Committee.  
C. Instructors in **BIOL 125 (Genetics)** will identify 3 key questions or problems from exams (preferably the final exam) that address this Performance Indicator and report results to the Undergraduate Committee *(not physiological science majors)*.  
D. Instructors in **BIOL 135 (Cell biology)** will identify 3 key questions from exams (preferably the final exam) that address this Indicator and report results to the Undergraduate Committee. | For the biochemistry and molecular biology majors, advisor groups from the two departments (biology and chemistry) will get together each year to discuss assessment results and determine if any changes are necessary. They will then report back to their respective departments. |

For B.-D. Essay questions that require critical thinking should be chosen when possible. For each question, the report should indicate the total number of students in the class and how many answered the question in these.
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<th>Human Biology and Physiological Sciences Majors only:</th>
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<tr>
<td>E. Demonstrate an understanding of the cellular and systemic mechanisms responsible for homeostasis in the human organism.</td>
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<th>Physiological Sciences Majors only:</th>
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<td>F. Demonstrate an understanding of the general principles or the organization and function of the vertebrate nervous system.</td>
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<th>Human Biology and Physiological Sciences Majors only:</th>
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<tbody>
<tr>
<td>E. Instructors in BIOL 172 (Human Physiology) will identify 3 key questions from exams (preferably the final exam) that address this Indicator and report results to the Undergraduate Committee.</td>
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<th>Physiological Sciences Majors only have additional assessment by:</th>
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<tr>
<td>F. Instructors in BIOL 155 (Neurobiology) will identify 3 key questions from exams (preferably the final exam) that address this Indicator and report results to the Undergraduate Committee.</td>
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For E.-F. Essay questions that require critical thinking should be chosen when possible. For each question, the report should indicate the total number of students in the class and how many answered the question in these categories: exceeds expectations, meets expectations, deficient.

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<th>2. Apply knowledge of scientific methods and experimental design to solve biological problems</th>
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<td>Demonstrate ability to design or modify experiment(s) to solve a biological question/problem.</td>
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In laboratory courses (BIOL 101, 126, 137, 156, 171), instructors will report results from at least one essay problem in which a student is required to design or modify an experiment to solve a biological question or problems. The results will be reported in categories of: exceeds expectations, meets expectations, or deficient.

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<th>3. Use critical thinking skills in analyzing biological data, demonstrated through written and/or oral presentations</th>
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<td>Demonstrate the ability to draw appropriate conclusions from biological data. Demonstrate ability to recognize and avoid bias in experimental design and interpretation of data. Demonstrate appropriate technical writing skills (and oral skills when part of course).</td>
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These 3 performance indicators apply to the laboratory courses listed above plus BIOL 195. Instructors will evaluate a selected laboratory report (or oral presentation) and report evaluations for each indicator as: exceeds expectations, meets expectations, or deficient.

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