

## 2007 MASTER PLAN/PROGRESS REPORT

**Academic Program:** BS Biological Science

**Person Responsible:** Dr. Mark Wygoda, Professor of Zoology and Department Head

**Date Submitted:** 29 May 2007

**Mission:** The purpose of the B.S. degree in Biological Science Program is to provide students with the knowledge and skills required for advanced study in graduate or professional schools.

**Institutional Mission Reference:** The B.S. degree in Biological Science Program supports the institutional mission of offering a baccalaureate degree distinguished by academic excellence. Students who receive a B.S. degree in Biological Science cultivate skills for critical thinking and effective expression and gain an understanding of the global community.

### Assessment Methods Utilized:

- Standardized Exam (nationally normed)
- Standardized Exam (state-normed)
- X Major Field Examination
- Internally-developed Examination
- Student Opinion Survey (SOS)
- National Survey of Student Engagement (NSSE)
- Employer Survey
- Graduate Survey
- Alumni Survey
- X Exit Survey/Interview/Exam
- Program-specific Survey
- Scoring of Essay
- Portfolio Evaluation
- X Capstone Project
- X Presentation
- Research Paper
- Research Project
- Course Summary
- Excel Spreadsheet
- Access Database
- X Other - Please describe: Embedded Exam Questions

### Data Repository Location:

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Frasch 230

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Frasch 230

**Student Learning Outcome 1:** Graduates apply critical thinking in academic and professional environments.

<u>Expected Level of Achievement</u>	<u>Actual Data From Assessment</u>	<u>Actions/Decisions</u>
<p>75% of all graduates will provide at least sufficient answers on embedded essay questions which test critical thinking skills in the following required courses: Genetics (Biol 315), Evolution (Biol 339), and Ecology (Biol 315).</p>	<p>No data are available at this time as this is a new student learning outcome.</p>	<p><b>D</b> Questions which test critical thinking skills that are suitable for inclusion in Biol 339, Biol 315, and Biol 410 exams will be embedded in exams and the results for each student will be reported to the department head each semester the course is taught. Data from graduating seniors will be extracted from the accumulated data base each semester and will be reported as actual data from the assessment.</p>

**Student Learning Outcome 2:** Graduates formulate and express ideas effectively through oral, written, and/or technological communications in academic and professional environments.

<u>Expected Level of Achievement</u>	<u>Actual Data From Assessment</u>	<u>Actions/Decisions</u>
<p>All majors will take at least one biology course in which they were required to synthesize and evaluate primary scientific literature and for which their oral and written communication skills are part of the course assessment.</p> <p>All graduating seniors will have taken a course requiring scientific literature review.</p>	<p>Synthesis and evaluation of primary scientific literature and assessment of oral and written communication skills are components of at least the following courses: Biol 423, Biol 458, Biol 481, Biol 404, and Biol 499. Because none of these courses are required and not all graduating seniors took at least one of these courses, this objective was not met.</p> <p>75% of the graduating seniors had taken a course requiring scientific literature review. This objective was not met.</p>	<p><b>M</b> Biol 481 became a required course for all biological science majors beginning with the 2006-07 degree plan. All students who follow this and subsequent degree plans will therefore be required to synthesize and evaluate primary scientific literature and present the results of their synthesis and analysis in both written and oral forms.</p> <p><b>M</b> Biological Science advisors have been alerted to the addition of Biol 481 to the curriculum and have been asked to recommend this course as an elective to students who are in degree plans prior to the 2006-2007 degree plan.</p> <p><b>R</b> Biological science faculty will continue to be encouraged to add a primary scientific literature component to all upper division biology classes. This encouragement will be reinforced during a meeting of biological science faculty to be held during Fall semester 2007.</p>

**Student Learning Outcome 3:** Graduates analyze the global community to make sound judgments in academic and professional environments.

<u>Expected Level of Achievement</u>	<u>Actual Data From Assessment</u>	<u>Actions/Decisions</u>
<p>100% of the graduates will identify four major world issues on the departmental exit survey which are directly related to the field of biology</p> <p>75% of the graduates will enroll in and successfully complete one of the following biology courses whose content includes issues related to global health care: Emerging Diseases and Healthcare Response (Biol 463), Medical Entomology (Biol 453), Parasitology (Biol 405), and Immunology (Biol 434)</p>	<p>No data are available at this time from the department exit survey on this student learning outcome because this is a new student learning outcome.</p> <p>50% of the graduating seniors enrolled in and successfully completed at least one of the following courses: Biol 463, Biol 463, Biol 405 and/or Biol 434..</p> <p>No data is available at this time to assess students' ability to analyze the global community from embedded test questions because this is a new student learning outcome.</p>	<p><b>D</b> Questions will be added to the senior exit exam which will require graduates to identify four major world issues which are directly related to the field of biology</p> <p><b>D</b> Embedded test questions will be added to Biol 463, Biol 453, Biol 405, and Biol 434 to assess students' ability to analyze the global community.</p>

**Student Learning Outcome 4:** Students will demonstrate general knowledge of biological science

<u>Expected Level of Achievement</u>	<u>Actual Data From Assessment</u>	<u>Actions/Decisions</u>
<p>50% of the graduating seniors will score at or above the national average for the total score on the ETS Major Field Exam in Biology.</p> <p>75% of the graduating seniors will score within one standard deviation of the national average on the ETS Major Field Exam in Biology.</p> <p>50% of the graduating seniors will score at or above the national average for each of the four subscores on the ETS Major Field Exam in Biology</p> <p>75% of the graduating seniors will score within one standard deviation of the national averages on each of the four subscores on the ETS Major Field Exam in Biology</p> <p>75% of the graduating seniors will have at least a 3.0 grade point average in the major.</p> <p>60% of students who apply for admission to graduate or professional schools will be accepted for admission.</p>	<p>35% of the graduating seniors scored at or above the national average for students taking the ETS Major Field Exam in Biology. This outcome was not met.</p> <p>60% of the graduating seniors scored within one standard deviation of the national average for students taking the ETS Major Field Exam in Biology. This outcome was not met.</p> <p>60% of the graduating seniors scored at or above the national average on the Population Biology, Evolution, &amp; Ecology subscore of the ETS Major Field Exam. The remaining subscore results were as follows: Cell Biology – 40%, Molecular Biology &amp; Genetics – 30%, and Organismal Biology – 35%. This outcome was partially met.</p> <p>60% of the graduating seniors scored within one standard deviation of the average on the Population Biology, Evolution, &amp; Ecology subscore of the ETS Major Field Exam. The remaining subscore results were as follows: Cell Biology – 50%, Molecular Biology &amp; Genetics – 45%, and Organismal Biology – 45%. This outcome was not met.</p> <p>85% of the graduating seniors had at least a 3.0 grade point average in the major. This outcome was met.</p> <p>It is known that at least 55% of the students filed applications with graduate or professional schools and of these, at least 64% gained admission This objective was met.</p>	<p><b>R</b> The results of the ETS Major Field Exam subscores from the previous year were discussed in a meeting of the biological science faculty which took place during Fall semester, 2006. The purpose of the meeting was to familiarize the faculty with those areas in which students were deficient and those areas in which they were proficient based on the Field Exam subscores. A decision was made to strengthen students' knowledge base of cellular and/or molecular biology by requiring all biology majors to include one of the following courses in their degree: Cell Biology (Biol 414), Molecular Biology (Biol 401) or Biochemistry (Chem 431). A curriculum change was proposed, accepted, and this new requirement appears in the 2007-2008 MSU catalog</p> <p><b>M</b> A meeting of biological science faculty will be held during Fall 2007 to review the most recent results of the Field Exam.</p>

**Student Learning Outcome 5:** Students will gain experience in using the scientific method.

<u>Expected Level of Achievement</u>	<u>Actual Data From Assessment</u>	<u>Actions/Decisions</u>
<p>All majors will take at least one biology course in which they gain experience using the scientific method.</p> <p>At least 25% of the graduating biological science seniors will have enrolled in and successfully completed a research course (Biol 404 or Biol 498-499).</p>	<p>Students enrolled in Biol 101L are taught the scientific method and gain experience using the scientific method while performing five separate 2 hour lab exercises. This objective has been met.</p> <p>35% of the graduating biological science seniors enrolled in and successfully completed a research course (Biol 404 or Biol 498-499). This objective has been met.</p>	<p><b>D</b> A survey of the content of upper division laboratory courses was done to determine which courses in addition to Biol 101L provide students with experience using the scientific method. Students gain experience in using the scientific method also in the lab portions of Biol 211, Biol 321, Biol 401, Biol 410, and Biol 458. The feasibility of including the scientific method in other labs will be discussed in a meeting of the biological science faculty to be held during Fall semester 2007.</p> <p><b>M</b> Faculty will continue to be encouraged to provide additional research opportunities for students.</p> <p><b>R</b> A departmentally produced brochure describing Biol 404 and Biol 498-499 will be revised with the purpose of attracting more students to enroll in these courses.</p> <p><b>M</b> Academic advisors will continue to be encouraged to recommend Biol 404 or Biol 498-499 to qualified advisees.</p> <p><b>M</b> All but one of the department's biological science research labs continue to be closed since Hurricane Rita struck in Fall 2005, hampering research efforts. Temporary research lab space in teaching labs and faculty offices continues to support student research.</p>