

**College:** Liberal Arts & Sciences – Natural Sciences

**Department/Program (s):** Biological Sciences

**Degree (s) Offered:** BA/BS Biological Sciences  
MS Biological Sciences

**Triggers:** MS Biological Sciences graduates (4.4)

**Brief Description of Each Degree:**

The undergraduate and graduate programs support the mission of the university through offering core curriculum at the undergraduate level and providing advanced experiential and classroom education in life science at the graduate level. The actual descriptions of the degrees offered within the Biological Sciences are rather limited within the document. However, the following information is a brief summary of the information provided in the WSU undergraduate and graduate catalogs:

**Undergraduate:** Offering a broad and flexible curriculum leading to BA\* and BS degrees including a field major in biochemistry. Students can major in Biological Sciences with an emphasis in one of the following study areas: a) Biological/Biomedical, b) Ecological/Environmental/Organismal, c) Biochemistry, or d) Secondary Education. The undergraduate program prepares students for careers in education, research, environmental studies, medicine, and other post-baccalaureate studies.

\*Note that inclusion of a BA degree was not apparent in the document.

**Graduate:** A variety of specialization options are available to students pursuing a MS degree in Biological Sciences; these include the areas of ecology, molecular biology, microbiology, cell, biology, and environmental biology. A doctoral degree program is not offered. Although more than 40% of MS graduates reportedly enroll in doctoral study at other universities.

**Assessment of Learning Outcomes (for UG and GR):**

**BA/BS Biological Sciences** – Use of a standardized measure (Field Achievement Test in Biology) for the first goal is to be commended; reporting of the number of students scoring at or above the mean would be more informative when the total number of students is also known. The expected outcome is unclear for the goal. – Perhaps stating 85% of graduates taking the standardized test will score above the mean would be more meaningful. Also, analysis of Goal #4 indicates that 60% ‘strongly agreed’ and 33% ‘somewhat agreed’ with having received a good education at WSU and would pursue a degree in Biological Sciences again. The survey item appears to be asking two questions and might be confusing students about how to answer it. Note: Learning Outcomes Goal #4 (UG, p. 12) indicated that the written survey was provided in an appendix – this was not available at this writing).

**MS Biological Sciences** – The table (p. 13) lists six student-focused learning outcomes. For 5 of the 6 outcomes, only one target/criterion is provided (75% of MS graduate students graduate).

The target/criterion and assessment toll could be revised to demonstrate a more direct link to the associated learning outcome. The information in Goal #5 provides an example of a more direct link to the learning outcome. Additionally, and as noted in the Dean's Evaluation, the 6 learning outcomes address primarily student outcomes rather than program outcomes. The outcomes, measures, and targets can be revisited to determine an additional focus toward program outcomes, accordingly.

**Placement of Graduates (types of positions, starting salary):**

Undergraduate: Data are available for year 3 only, indicating that 100% of graduates responding to the exit survey (N=3) are employed (n=1; \$35,000) or seeking graduate degrees (n=2). The type of position was not indicated for the respondent reporting employment.

Graduate: The table on p. 19 does not clearly reflect the information provided in the narrative comments (p.20). The table shows that 60% of Biological Science majors were employed in the field/related field in year 2 and 3; whereas the narrative describes 83.3% of students employed in scientific research or education (FY 2009-2011). It is further noted that no data were reported in the table for year 3. Average salaries were reported for years 1, 2, and 3 (\$36,887, \$35,660, and \$23,220, respectively). Six students, over the 3-year reporting period, indicated activities related to further study (doctoral/other professional education). The narrative further describes more than 40% of graduates pursuing advanced degrees (PhD). Four graduates are employed in research technician positions, working in biomedical or environmental labs. One graduate is employed as an adjunct instructor at a community college.

**Faculty Resources:**

During the last three years, there were 9 -10 tenure/tenure track (TTT) faculty in the Biological Science Department with instruction responsibilities. TTT faculty were supported by 4-5.5 graduate teaching assistants (GTA) and 2.8-5.3 lecturers. Nearly all graduate students (MS) are employed as GTAs for at least one semester during the program of study. Data were unavailable to determine the percentage of total student credit hour produced by TTT faculty or other instructional FTEs.

Recently, two new faculty were hired for the graduate degree program bringing the total number of TTT faculty to 10. This is half the number of faculty at relatively similar small Biological Science programs.

**Sources of External Support:**

Overall, the TTT faculty (N=9-10) have demonstrated a commitment to scholarship with an average of 9 publications and 16-29 presentations annually. External funding has been maintained over the past three years ranging from \$65 thousand to \$6.7 million.

## **Conclusions and Recommendations:**

### *Commendations:*

- The Biological Science Department provides good service to the university through foundational biological instruction to university students.
- The undergraduate degree prepares students for entry in a number of highly desired fields including biomedical, biochemical, ecological, and environmental.
- The thesis-based MS program provides a sound research foundation and prepares students for continued education in doctoral programs.
- Learner outcomes are thoughtful and appropriate at the undergraduate level.
- A standardized survey is used to assess learner competence in the biological sciences at the baccalaureate level.
- Department TTT faculty are productive in terms of scholarship and external funding.

### *Recommendations:*

By April 1, 2013 (send to the Office of the Provost)

- Document that the program review process is a part of a continuous improvement approach involving all departmental faculty.
- Document program changes that occurred through assessment of student learner outcomes and other data collected.
- The learning outcomes for all programs (and general education courses) should be further developed and a revised assessment process needs to be implemented to include the following for all programs:
  - Learning Outcomes: Statements that describe what students are expected to know and be able to do by the time of graduations. These relate to the skills, knowledge, and behaviors that students acquire through their program (e.g., graduates will have the ability to apply the principles of molecular biology).
  - Assessment Methods: Direct measures used to identify, collect, and prepare data to evaluate the achievement of learning outcomes (e.g., a quantitative measure of biochemical cycling evaluated by a rubric, not grades or indirect measures.)
  - Targets: Expectations of students to achieve the desired outcome to demonstrate program effectiveness (e.g., 90% of student scores on the Field Achievement Test in Biology will be above the mean)
  - Results: Actual achievement on each measurement (e.g., 90% of the students achieved at least the benchmark performance on the project).
  - Analysis: An evaluation that determines the extent to which learning outcomes are being achieved and leads to decisions and actions to improve the program. The analysis and evaluation should align with specific learning outcomes and consider whether the measurement and target remain valid indicators of the learner.
- Update on plans for increasing graduates in the MS program.
- Address concerns of the Graduate School in terms of the assessment process for the graduate program.

Prior to the next review in 2015:

- Include the new university exit and alumni surveys in the assessment plan. This will include placement data, salaries, and student satisfaction.