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DEPARTMENT OF BIOLOGICAL SCIENCES  
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**DATE:** February 5, 1997  
**TO:** Michelle Hall  
Research Associate  
**FROM:** Gary W. Childers  
**RE:** **Update on Major Field assessment**

The various Major Field Assessment forms that you and Dr. Moffett requested are attached, including information for all assessment programs from the Department of Biological Sciences ( BS-Sci, MS-Sci, BS-Hort, BS-Sci Ed).

**1. B.S. Degree in Biological Sciences:**

The Department of Biological Sciences revised the major field assessment plan for the B.S. Degree in Biological Sciences September 2, 1993 (hard copy attached). This plan was again revised October 20, 1993 (hard copy and electronic copy attached). The purpose of the final revision was to eliminate the National Major Field Achievement Test and replace it with a departmental achievement test. We have been giving the exam to students enrolled in both sections of GBIO 441 each semester since the Spring semester 1993. In the Fall 1996 semester we initiated a pilot type capstone seminar course to be taught to one of the two sections of GBIO 441, (undergraduate seminars). The conventional exam was given in the other section of seminar. The dual exams will be given until it can be determined which exam is a more effective evaluation tool.

We are also recommending the departmental exit exam be discontinued and the following questions be added to the University Exit Survey:

1. The overall education you received in the Biology Department?
2. The average quality of the instructors that taught Biological Science courses that you took.
3. The overall education you received in courses outside the Biology Department?
4. The average quality of instructors in courses outside the Biology Department?

5. The availability of academic advising (in the Biological Sciences Department)?
6. The quality of academic advising you received?
7. The quality of career counseling in your major that you received?
8. The outlook for a job or further study in your major field
9. The quality of the classroom facilities in the Biology Department (seating, lighting, air conditioning, chalkboards, etc.)
10. The quality of laboratory facilities in the Biology Department?
11. The quality of laboratory equipment and supplies (microscopes, models, specimens, etc.)?
12. The quality of field trips, field work, field stations, and factors related to any field experiences you may have had in your studies.
13. The helpfulness of the Biology office staff and support personnel?
14. The access to and helpfulness of the Biology chairman?
15. The access to and helpfulness of the Biology faculty outside the classroom?
16. The access to and helpfulness of other administrators and their staffs on campus Dean, Registrar, Financial Aid, etc.)?
17. The organization of the curriculum (course requirements) in your major?
18. Did the lower level preparation Biology courses (100-200 level) give you foundation (for the upper level (300-400) courses in your major)?
19. The availability of required Biology courses in your major?
20. The availability of required non-Biology courses?
21. The student is asked their major or field of concentration.

Narrative Report for 1995-96 Each semester the tabulated test results of the multiple choice exam are filed in the department office. The results are less than desirable primarily because there is no incentive for students to prepare for the exam. We are now experimenting with a capstone course that will allow students to review the most fundamental aspects of biology (Biology Seminar, GBIO 441, Foundations of Biology, see attachment). This course is currently being piloted for a second time by Drs. Shaffer and White. According to a paired t-test this course resulted in a significant increase ( $t=3.51$ ,  $P<0.0025$ ) in scores on the exit exam. Several improvements have been made to the current course and we expect

scores will be even higher as a result. At the present time we are giving the original departmental multiple choice exam in GBIO 441-01 and we are using the capstone course as an exit exam for the Major Field Assessment evaluation instrument in GBIO 441-02.

## **2.ASSESSMENT FOR GRADUATE PROGRAM IN BIOLOGICAL SCIENCES**

### STATEMENT OF GOALS AND INTENDED OUTCOMES

The Department of Biological Sciences uses a tightly integrated series of assessment techniques to determine the progress of our graduate students during their Master's degree program. The goals of the assessment procedures are as follows:

1) Determine the presence of any serious academic deficiencies of the student as determined by a Preliminary Written Exam

2) Using a Preliminary Oral Examination, determine whether students (a) have remedied any deficiencies identified above, and (b) determine whether students are ready to proceed with independent research

(3) Using a Final Comprehensive Oral Examination, determine (a) of all deficiencies have been remedied, and (b) the student's skills at conducting independent research in the biological sciences.

The intended outcome of these procedures to produce well-qualified graduate students who are ready to either obtain positions in government or industry or who are ready to continue their education with a Ph.D.

### SUMMARY OF METHODS OF ASSESSMENT

#### **A) Preliminary Written Exam**

1) Results Obtained-- The Preliminary Written Exam is a 100-question exam given to all incoming graduate students during their first two weeks of enrollment. The primary goal of the Preliminary Written Exam is to determine areas of deficiency in a student's background. However, the exam does require a passing grade of 70%. Students who do not achieve a passing score in their first attempt are allowed to repeat the exam two months later. If the student fails a second time, the student is dismissed from the Graduate Program at the end of the semester.

Since the exam was instituted in 1990, 32 students have taken the exam. Of these, about 40% have failed the exam on the first attempt. However, only one student has failed the exam on the second attempt.

2) Changes in the Program-- (a) The Graduate Coordinator meets with all students after the exam is graded to discuss areas of deficiency and how these weaknesses can be

rectified. (b) The Graduate Coordinator contacts all incoming students well ahead of registration to discuss the Preliminary Written Exam, and insures that all students are aware of the difficulty of the exam. (c) The Graduate Coordinator is available to recommend textbooks for study to help students prepare for the exam. (d) The Graduate Coordinator now schedules an Orientation Program with all incoming students to discuss the major steps in the evaluation process. (e) The department has written a Graduate Student Handbook to review all steps in the evaluation process.

3) Planned Changes in the Program-- (a) Based on student feedback, the Graduate Coordinator will review the questions on the exam each year for clarity and utility. (b) The Graduate Coordinator will obtain new questions every other year from the Graduate Faculty. (c) Based on student feedback, the Graduate Student Handbook will be updated yearly.

## **B) Preliminary Oral Examination**

1) Results Obtained-- The Preliminary Oral Examination was instituted in 1990 to (a) determine if deficiencies identified during the Preliminary Written Exam have been rectified, and (b) determine whether students have made sufficient progress to begin thesis research. The exam is held during the second or third semester of enrollment. The exam is supervised by the Graduate Coordinator, and is attended by the student's thesis committee and any interested Graduate Faculty.

Since 1991, 23 students have been tested in this manner. Results varied from early termination of the exam to allow better preparation (three cases) to complete satisfaction. In most cases, at least one major area of deficiency is identified, usually resulting in the student taking at least one additional graduate course.

2) Changes in the Program-- (a) Based on feedback from graduate students, the Department instituted a seminar course entitled "Professional Aspects of Biology", which addresses the need for effective oral communication as a key for professional success and trains graduate students in effective oral communication skills. (b) Students are strongly encouraged to conduct simulated oral exams to prepare for the actual event.

3) Planned Changes in the Program-- (a) Based on student feedback, all Graduate Faculty members are being encouraged to use oral exams in their graduate courses, to help prepare students for the Preliminary Oral Examination. The Graduate Faculty have discussed making this a requirement of some graduate classes.

## **C) Final Comprehensive Examination**

1) Results-- The Final Comprehensive Examination is given to all students at the end of their studies at SLU. This exam is in two parts; first, students are required to present a 30-40 minute seminar on their thesis topic, followed by questions for the general audience (any faculty or student is allowed to attend this exam). Second, the student and his/her Graduate Thesis Committee conducts a 1-2 hour oral examination. This final exam is designed to (a) determine if all deficiencies have been rectified, and (b)

determine the student's progress in oral communication skills. The Graduate Committee uses the results of the Preliminary Oral Examination as a guide to determine what areas need to be emphasized during this exam.

In the last three years, nine students have taken this exam. All have passed on the first attempt, although some have obviously done better than others. All students tested have shown considerable progress since the Preliminary Oral Examination.

2) Changes in the Program-- (a) As noted above, the Department instituted a seminar course entitled "Professional Aspects of Biology", which addresses the need for effective oral communication as a key for professional success and trains graduate students in effective oral communication skills. This has greatly enhanced the speaking skills of our students. (b) Students have been provided with better training in the use of computer-aided graphics to design their seminars.

3) Planned Changes in the Program-- (a) The Department is attempting to upgrade the quantity and quality of the computers available to graduate students to design their graphics, but has been unsuccessful in doing so. This is a high priority in FY 95.