

# **External Review Committee Report**

Comprehensive Program Review

Bachelor of Science in Biology

Bachelor of Arts in Biology

Bachelor of Arts in Biology with Secondary Education

Columbus State University

Submitted: February, 2013

# **I. Introduction**

## **A. Membership of Outside Committee**

- Dr. Thomas Nelson  
Professor of Biology and Dean of Arts and Sciences  
Southern Polytechnic State University  
Marietta, GA
- Dr. Barbara Hunt  
Professor and Former Chair of English  
English Department  
Columbus State University  
Columbus, GA
- Dr. Mark Schmidt  
Professor and Chair of Psychology  
Department of Psychology  
Columbus State University  
Columbus, GA

## **B. Procedure Followed and Information Gathered:**

In advance of the campus site visit, the Committee was provided with documentation in support of the Department of Biology's self-assessment. This documentation included an Executive Summary prepared by Dr. Julie Ballenger (Department Chair), Detailed Program Self-Study, faculty curriculum vitae, student and alumni surveys, results of the Major Field Test assessments of graduating seniors, and copies of recent Departmental newsletters. A site visit was conducted on December 3, 2012. On that day the committee met with the Department chair (Dr. Julie Ballenger), as well as Drs. Brian Schwartz and Katie Hughes, most members of the Biology faculty, and a group of biology majors, toured the classroom and laboratory facilities, and visited the Oxbow Meadows Environmental Learning Center.

## **II. Findings of the External Review Committee**

### **a. Assessment of Program Quality**

- The Committee's finds that the programs in Biology are well above average.
- In most areas of evaluation, the assessments were either "above average" or "very strong".
- Quality of faculty was very strong and their commitment to their students, programs and the University were excellent.
- A high percentage of full-time faculty (93%; 13/14) hold terminal degrees in Biology, as do 3 of 4 part-time faculty members.
- The curriculum compares very favorably with CSU's competitor and aspirant institutions. It provides a broad introduction to the biological sciences without being overly prescriptive. After completing a solid foundation of biology in the freshman-junior years, students have opportunities to "sample" upper-division electives and/or concentrate on a particular sub-discipline within Biology during the senior year.
- The quality of teaching is very strong with 91% of current students and alumni who responded to surveys rating instruction as very good or good.
- Of nearly 2,000 students responding to course evaluations, the vast majority found Biology instructors to be knowledgeable, prepared, effective, and respectful of students. Similarly, students found the courses to be challenging and valuable in developing their critical thinking and problem-solving skills.
- The relationships formed between students and teachers are also very strong. 74% of students and alumni found the quality of advisement to be very good or good and 93% rated student-faculty relationships to be very good or good. These are the hallmarks of a faculty committed to its students and their success.
- The Committee found the B.S. and B.A. in Biology and B.A. in Biology with Teacher Certification curriculums to be above average and appropriate for students with a wide range of career goals and interests.
- Oxbow Meadows Environmental Learning Center provides an exceptional facility to support teaching and research in ecology, evolutionary biology, and applied research.

- The primary issues voiced by the students we talked with concerned the (1) availability of courses, (2) variety of courses, and (3) poor quality of laboratory facilities and equipment.
- We found the new Competitive Premedical Studies program to be very novel and a viable means of attracting high-quality students to CSU. As job opportunities in medicine and other health-related fields continue to expand, this program is most timely.

#### **b. Recommendations for Improving Program Quality**

- Laboratory facilities need to be upgraded to maintain a competitive, quality Biology program.
- Although a new science building is needed, renovation and repurposing of space in LeNoir Hall could provide short-term relief. Specifically, two large spaces (one dedicated to the zoology collection and another to boat and field equipment) could be renovated to provide much-needed teaching and research laboratories. Stored specimens and outdoor equipment do not require heated/cooled space, so these could be transferred to shipping containers or a steel building at relatively little cost, freeing valuable space for laboratories in LeNoir Hall near classrooms and faculty offices.
- Adequate funding needs to be allocated to the Department to ensure that vital equipment is available and operational. For example, we were told by students and faculty that the Department's only autoclave went down last year necessitating the cancellation of several weeks of laboratories. Autoclaves, centrifuges, and other key equipment items are so fundamental that the department needs some redundancy to ensure that a back-up is available should the primary equipment fail.
- The Department has already taken steps to alleviate that 3000-level bottleneck of requisite courses by offering these more frequently. This should reduce student frustration with the lack of requisite offerings and improve RPG. To offer these courses more frequently, and to address student concerns about the lack of variety in upper-division courses, the department needs to add 2 new tenure-track faculty with expertise in areas that complement existing faculty.
- Currently, highly trained faculty are spending a disproportionate amount of time teaching freshman lectures and labs. We recommend that the department split the freshman course into separate courses for majors and non-majors. Majors need to be

introduced to the fundamentals of cell biology, biochemistry, and biological diversity so that they have the necessary foundation to succeed in upper-division courses. Non-majors on the other hand need a different type of course with an emphasis on understanding their own bodies, the process and limitations of science, and current issues in biology and medicine.

- This non-majors course could be taught in larger sections or using hybrid formats, using full-time lecturers and part-time faculty, freeing tenure-track faculty to concentrate on the freshman majors' course and upper-division courses. Cost-savings would come from hiring lecturers with lower salaries and higher teaching loads than tenure-track faculty. Alternatively, on-line lectures and labs could be developed by a tenure-track faculty member (with release time), then subsequently administered by part-time faculty. We suggest that 2 new lecturers be hired to meet this need.
- The curriculum would be improved if an applied statistics course (e.g. biostatistics or biometrics) were developed to replace the statistics course that is currently required.
- Currently the language requirements in Areas F and G (depending on which BA program) start with 2001 rather than 1002, thereby creating a "hidden" elective of 1002. Since BA degrees only need to include coursework through 2001, the Department might consider changing the language requirements from 2001 and 2002 to 1002 and 2001, streamlining the path to graduation.
- Some field-based classes are limited in size due to transportation issues. That is, class size is limited to the number of students who can fit into a van. Limiting upper division class size affects the rotation schedule, RPG, and tuition revenue, especially in a growing program such as this. It would appear to be cost-effective for the University to expand the number of students served by providing additional transportation (another van or bus) and drivers.

### **c. Assessment of Program Productivity**

- Productivity is very good given high teaching loads.
- The committee noted particularly the success the Department exhibits in mentoring undergraduate research, including the large number of presentations made by CSU students at state and regional conferences.

- Data provided by the department suggest a 6-year graduation rate of ~180 with 400 majors, a 6-year graduation rate of ~45%. While this rate can be improved, it is not significantly different than that of other Biology Programs in the USG.

#### **d. Recommendations for Improving Program Productivity**

- Development of a robust student tracking system that allows the department to better assess retention, progression, and graduation rates would be beneficial, particularly if the data allows the department to better understand how many students leave the major, where they go, and why they leave. One potential concern from the student surveys was that 29% of graduates reported that they would select another major “if they had it to do over”. We recommend that the Department revise the survey so that students are asked why they would select another major. The responses to that question would provide valuable feedback for taking appropriate remedial actions.
- Productivity of faculty could be increased by adding the proposed M.S. in Biology program. With degree inflation, an M.S. degree has become a standard requirement for biologists in almost any line of work. The USG graduates hundreds of biology majors annually and many of these graduates cannot find graduate assistantships in Georgia or the Southeast. CSU has a quality faculty conducting compelling research and with adequate funding could be a “first choice” destination for B.S. graduates seeking graduate education.
- While we are very supportive of the proposed M.S. degree in Biology, the University must ensure that there are sufficient faculty, space, and resources to support the graduate program without sacrificing the high quality of the current undergraduate program,
- If it is developed, the M.S. degree needs to be carefully distinguished from the current M.S. in Environmental Science so that they are not competing for the same students.
- Tenure/tenure-track faculty and program productivity would benefit by reducing teaching loads from 12 to 9 hours. The cost of these workload reductions could be offset by increasing the use of lecturers, part-time faculty, and future graduate assistants to teach freshman classes and supervise lab sections.
- Additional funds should be made available for faculty to travel and present their research at professional conferences. At current levels of support, the Department reports that faculty often must choose between travel to support student research and travel for their own professional development.

- Students expressed some concern with communication between the Department of Biology and the COEHP regarding courses required for the BA with Teacher Certification. We suggest that an ad hoc committee of faculty from both areas convene to review these requirements and prepare a student guide clearly stating these course requirements.

#### **e. Assessment of Program Viability**

- The large number of majors (~400), quality of research, and reasonable retention and graduation rates, suggest that the biology programs at CSU are viable and robust. Workforce projections through 2020 indicate that the state of Georgia will require trained biologists particularly in the areas of health care, environmental science and management, STEM education, and biotechnology. Job growth in each of these areas is expected to exceed those in most other fields. CSU's program should continue to be an important source of graduates in these fields.
- As mentioned earlier, the M.S. degree has become the norm for employment in most sciences including biology. We recommend serious consideration of adding an M.S. degree program in biological sciences.
- Finally, the review committee applauds the addition of both an A.S. degree in Biology and the new Competitive Premedical Program. The first will improve retention rates, and the second will attract more and even better students.

#### **f. Recommendations for Improving Program Viability**

- Retention, progression, and graduation (RPG) rates are low across most USG institutions, including CSU. Unique programs such as the Competitive Premedical Studies Program and the organismal biology program have the potential to attract strong students to CSU. Once students are enrolled in the program, efforts need to be expanded to retain and graduate these students. Steps have been taken to alleviate some of the bottlenecks that have discouraged students in the recent past, including teaching genetics and cell biology each semester rather than annually, and offering a broader array of upper-level elective courses including appropriate non-biology 5000-level electives.
- The department should explore expanding their fully-online and hybrid course offerings as a means of reaching a broader audience (e.g. Fort Benning personnel

and adult learners). Some courses lend themselves to fully online formats more than others, but most could be offered in a hybrid format with lectures online and labs meeting face-to-face. Faculty might consider using lecture capture technology (e.g. Tegrity) in appropriate courses so that lectures and classroom discussions are available to students for review outside of class.

- A broader audience could also be reached by exploring “reduced residency” lab scheduling, whereby non-traditional students come to campus once a month (usually Saturdays) to complete a day-long series of lab exercises. This allows working adults and distance-learners to participate without traveling to campus frequently. This might allow CSU to reach large populations in the Atlanta-metro area, where daily/weekly commutes are difficult.

### **III. Final Recommendation of the Review Team**

In summary, the external review committee recommends the following:

- Upgrade laboratory facilities including renovation and repurposing of space in Lenoir Hall
- Allocate adequate funding to ensure that vital laboratory equipment is available and operational
- Add two new tenure-track faculty members with expertise that complements that of existing faculty
- Reduce teaching loads of tenure-track faculty to 9 contact hours per term
- Split the core Principles of Biology course (BIOL 1215) into two separate courses (majors and non-majors) with different learning outcomes in each
- Add two new full-time lecturer positions to assist in teaching the non-majors sections of BIOL 1215
- Add an applied statistics / biostatistics course to the biology curriculum to replace the currently required STAT 1127
- Consider changing the two foreign language course requirements for the BA degree to 1002 and 2001 level courses
- Provide additional transportation resources to better serve students in upper-division biology lab courses
- Develop a tracking system to better assess RPG
- Proceed with development of the new MS biology program while ensuring that sufficient faculty, space, and resources are provided and that the new program is distinct from the MS program in environmental science
- Increase funds dedicated for faculty travel to professional conferences



- Communicate with the COEHP to develop a student advising guide which clarifies the requirements for the BA with teacher certification
- Explore potential use of more hybrid courses, lecture capture technologies, and “reduced residency” lab scheduling as ways to reach a broader sample of students

## **Signature Page**

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Dr. Thomas Nelson  
Professor of Biology and Dean of Arts and Sciences  
Southern Polytechnic State University

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Dr. Barbara Hunt  
Professor and Former Chair of English  
English Department  
Columbus State University

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