GEORGIA SOUTHWESTERN STATE UNIVERSITY
ACADEMIC COMPREHENSIVE PROGRAM REVIEW:
B. S. IN BIOLOGY

COORDINATED BY DR. STEPHANIE HARVEY
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Executive Summary

Major Strengths
The B.S. program in Biology at Georgia Southwestern State University (GSW) continues to provide high-quality instruction in the biological sciences that allows their graduates to successfully compete for entrance in both graduate and professional programs, or to gain employment as researchers and educators. The breadth of the program and faculty offers students opportunities to explore a variety of fields within biology. Its ability to provide students with a comprehensive, high-quality education has been noticed by graduate and professional programs. In addition, the department provides a significant number of service courses to the university. It provides both a non-major’s introductory sequence with associated labs and a non-lab botany course for Core Area D. For both the School of Nursing and the Exercise Science program, Biology provides Human Anatomy & Physiology I & II and Microbiology; for Nursing these courses are required prior to entrance into their program. In addition, each fall term a member of the Biology faculty teaches half of ISCI 2001 (Life and Earth Science for Early Education) which is a required course for all students in the Early Education program.

Areas for Improvement
There are two areas for improvement. One area that needs addressing is better laboratory, classroom and storage facilities. While some aspects of this deficiency have been addressed in the last two years, others have been exacerbated. The lab spaces are overused and have received little attention over the past 20 years. The services within the spaces are not always sufficient and fixtures are showing significant signs of aging. Lack of a centralized storage area was a concern raised by an external reviewer in a previous CPR and is still an issue. Additionally, the department lost a large amount of storage space with the loss of the "Mix" trailer behind the Science and Roney buildings. Unlike other areas in academia, the sciences – biology in particular – require equipment, supplies, models and specimens for students to study and manipulate.

Biology would also like to increase the use of modern molecular techniques in its program. This requires a significant investment in equipment and a significant increase in the operating budget to supply the consumables for these labs. Additionally, there needs to be some funding to support the student research that takes place as part of the capstone courses (BIOL 4010A/B). The department provides equipment for projects but often the cost of consumables has to come out of the student’s pocket. The department would also like to investigate ways to have students pay for field trips as part of the cost of the class. Currently the cost of the trips is mostly absorbed by the department, but food and camping cost are paid by the students on/after the trips. This often places a monetary burden on the students at the leanest times of the semester.

Key Opportunities
Around the globe there is continuing demand for individuals in biology related fields. With an aging population, the need for more people in the medical field continues to increase. The need for Physicians Assistants (PA) has dramatically increased over the years (AHRQ, 2012). PA programs are very
competitive and students need the best preparation to get accepted. The Biology program provides the necessary courses and level of intensity that a student needs to gain entrance and be successful as a PA and in all biomedical professional programs.

Over the last two years, a good working relationship has developed between Biology and the Parks at Chehaw. Biology has been collaborating to offer courses in zoo animal management as special topics within the program. Several students have worked there as a result of this partnership. A similar relationship is being investigated with the Flint River Aquarium.

Biology has also been approached by CH2M HILL, the wastewater management company contracted for the city of Americus. They have invited the department to use the property under their management for research and local field trips. Mr. Michael Pepito, the local contact for CH2M HILL’s sustainability project, is eager for students to conduct diversity assessments on both the flora and fauna of the discharge area. During Fall 2014 and Spring 2015, a student will be conducting a tree survey of the property for her capstone project.

**Key Challenges**

A key challenge for the Biology Program at GSW will be determining how to handle students that are severely under prepared for college in general and especially for challenges of the Biology program. This is clearly reflected in the poor retention of new majors from the freshman class. The challenge is: a) can these students be identified and then provided with supportive courses to help them be successful or b) can they be identified and redirected to another field before they withdraw/fail the major introductory sequence.

Funding and space are other serious challenges facing the department. Science is expensive and, as mentioned earlier, requires dedicated space. With continuing cuts to budgets and increased cost of essentials, it is difficult to maintain the quality of the laboratory exercises. The department also needs an additional staff member to support laboratory offerings in both the CORE and in upper division courses. It is not an efficacious use of faculty to have them setup labs, make solutions and clean glassware. Their time is better spent working directly with students, engaging in faculty development, and conducting research.

**Draft Strategic Plan**

The Biology Program at Georgia Southwestern is productive, challenging, and diverse. However, there are several things which could be done to improve the program. In brief, the strategic plan for 2015-2020 would include the following:

- Improvements to Biology Department spaces.
- Investigate ways to target students who are less likely to succeed and prove them with support and/or alternative degree options.
- Additional support staff to make more efficient use of faculty.
- Continued improvements in the curriculum will be made to make the program better and more attractive to potential students.
B.S. in Biology at Georgia Southwestern State University

The Mission of the Biology Department

The Department of Biology at Georgia Southwestern State University aims to provide students with a comprehensive education that cultivates lifelong learning through the application of scientific knowledge.

Students learn the fundamentals of biology and implement them through applied pedagogy and undergraduate research. Through this instruction they develop the critical-thinking skills necessary to assimilate, interpret and communicate scientific knowledge. The students become competitive for the best opportunities available following graduation, including professional and graduate school programs.

In keeping with the mission of the department, faculty provide the knowledge and training in the biological sciences that allow Biology graduates to obtain jobs and be successful in graduate and professional schools. This aligns well with the mission of Georgia Southwestern State University (GSW) which states that GSW “cultivates excellence in learning and teaching that encourages intellectual, personal, and social growth for students, faculty, staff, and the community” (gsw.edu/about-gsw/mission-statement, accessed 2014). In addition to the needs of the B.S. in Biology program, the department provides service courses for the Core Curriculum of the university and for the School of Education and School of Nursing.

Productivity of the Department

The highly-qualified faculty (see Curriculum Vitae in Appendix) are able to serve the B.S. in Biology program and the needs of other programs across the University. From Fall 2008 to Spring 2014, the Biology faculty taught an average of 858 students per year (Table 1). Beginning in Fall of 2009, one Core service course was lost each fall in order to teach the ISCI 2001 course required by the School of Education for their Early Childhood program. While the course is taught by two instructors (one from Biology and one from Geology) the demands of this hands-on course (4 contact hours per week) did impact the department’s other offerings. Over the years, to keep up with the demand for service courses, Biology increased class size limits until they reached the seating capacity of the space. This is contrary to pedagogical studies that show smaller class sizes are more effective. The number of students instructed increased 25.4% during the window of this study. In Fall 2013, a new faculty line allowed class sizes to be lowered, while providing more offerings.

Laboratory courses are a critical component to the service courses provided. The nature of these courses requires a firm limit to the number of students per class. Thus, to provide enough lab seats for the students in the larger non-majors biology lecture courses, 12 to 16 lab sections must be offered each
year. Each section meets for two hours a week and thus results in 32 contact hours per year. Additionally, the preparation and clean-up effort is laborious and time consuming. These labs have a significant impact on Biology’s facilities and faculty.

To provide biology major students with the greatest breadth of study, most of the upper division courses have been placed on a two-year schedule (course sequence shown in Appendix B). Only 4 specific courses are required of every student in our program (Genetics, Ecology and the two seminars) and these are offered every year. Courses in rotation are organized such that there is always a course offered within the academic year to fulfill the specific area requirements of our program. Special Topics courses provide biology students with opportunities to explore more diverse topics. These courses (typically 2 credit hours) have included Biostatistics, Bioethics, Ecology of the Okefenokee Swamp, Conservation Biology, Fishery Science and Zoo Animal Care and Maintenance.

To insure quality contact amongst majors and faculty, upper division course are limited to 15 or 20 students in most classes. The mean number of students served in these courses over the period of this study was 180 per year (Table 2). These courses, with the exception of the Special Topics and Biological Resources, have integrated laboratory hours. As with the lab service courses, these contribute to faculty load not only through the increased contact hours but preparatory and clean-up time as well.

The numbers of students in some courses has dropped in the last few years. This is primarily due to unavoidable scheduling conflicts. Many biology courses only meet for 50 minutes twice a week due to

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1107 - Essentials of Biology I</td>
<td>Area D; Nursing; Health &amp; Human Performance</td>
<td>201</td>
<td>195</td>
<td>226</td>
<td>214</td>
<td>220</td>
<td>214</td>
<td>175</td>
</tr>
<tr>
<td>BIOL 1108 - Essentials of Biology II</td>
<td>Area D; Nursing; Health &amp; Human Performance</td>
<td>86</td>
<td>85</td>
<td>72</td>
<td>78</td>
<td>83</td>
<td>88</td>
<td>28</td>
</tr>
<tr>
<td>BIOL 1107L - Essentials of Biology I Lab</td>
<td>Area D; Nursing; Health &amp; Human Performance</td>
<td>132</td>
<td>183</td>
<td>193</td>
<td>188</td>
<td>189</td>
<td>198</td>
<td>139</td>
</tr>
<tr>
<td>BIOL 1108L - Essentials of Biology II Lab</td>
<td>Area D; Nursing; Health &amp; Human Performance</td>
<td>54</td>
<td>83</td>
<td>65</td>
<td>52</td>
<td>70</td>
<td>72</td>
<td>23</td>
</tr>
<tr>
<td>BIOL 1500 - Applied Botany</td>
<td>Area D</td>
<td>23</td>
<td>25</td>
<td>21</td>
<td>46</td>
<td>24</td>
<td>22</td>
<td>-</td>
</tr>
<tr>
<td>BIOL 2107 - Principles of Biology I</td>
<td>Area D; Nursing</td>
<td>75</td>
<td>61</td>
<td>75</td>
<td>61</td>
<td>62</td>
<td>49</td>
<td>60</td>
</tr>
<tr>
<td>BIOL 2108 - Principles of Biology II</td>
<td>Area D; Nursing</td>
<td>38</td>
<td>30</td>
<td>51</td>
<td>28</td>
<td>38</td>
<td>27</td>
<td>-</td>
</tr>
<tr>
<td>BIOL 2030 - Human Anat. &amp; Phys. I</td>
<td>Health &amp; Human Performance; Nursing</td>
<td>60</td>
<td>69</td>
<td>66</td>
<td>70</td>
<td>83</td>
<td>129</td>
<td>50</td>
</tr>
<tr>
<td>BIOL 2040 - Human Anat. &amp; Phys. II</td>
<td>Health &amp; Human Performance; Nursing</td>
<td>45</td>
<td>44</td>
<td>56</td>
<td>55</td>
<td>64</td>
<td>55</td>
<td>20</td>
</tr>
<tr>
<td>BIOL 2050 - Microbiology</td>
<td>Health &amp; Human Performance; Nursing</td>
<td>22</td>
<td>39</td>
<td>43</td>
<td>41</td>
<td>40</td>
<td>39</td>
<td>-</td>
</tr>
<tr>
<td>ISCI 2001 - Life and Earth Science</td>
<td>School of Education</td>
<td>-</td>
<td>19</td>
<td>19</td>
<td>30</td>
<td>31</td>
<td>30</td>
<td>22</td>
</tr>
</tbody>
</table>

* Academic Years do not include courses taught during summer. °Academic Year 2014 represent only Fall semester and thus reflect approximately 50% of load.
the additional hours in lab. When the time blocks for courses were changed to 1.25 hrs – twice a week, critical morning sections were lost. Where previously there were four time slots for lecture on Mondays and Wednesdays, it has now been reduced to two. This has made scheduling incredible difficult and it has been impossible to avoid conflict amongst biology courses and the other courses (physics and chemistry) required of our students.

As mentioned above, the responsibilities of Biology faculty extends to the preparation and cleanup for laboratory courses in addition to the contact hours themselves. The contact hours associated with lab courses range from two to four hours per week per class. Often, due to the nature of the laboratory exercises, this contact exceeds the schedule hours of the lab. While it does not begin to demonstrate the work load handled by the Biology Department faculty, “Credit Hours Generated” can provide some insight into the productivity of this department. Over the past six years, they have generated on average over 540 credit hours per faculty member each year (Table 3).

Faculty Expertise

The Biology Department is composed of highly qualified faculty that further the mission and goals of the program. All Biology faculty hold PhD’s in various areas of biology and have the requisite number of graduate hours in the field. All faculty credentials meet academic standards of regional accreditation.
agencies. Collectively, the department represents over 125 years of teaching experience and is composed of four full professors, one associate professor (currently seeking promotion to full) and one assistant professor.

Biology is an extremely broad-spectrum science and scientists within it tend to become highly specialized in a particular area. It can be very difficult to balance that specialization with the needs of a small department when hiring new faculty. The department has done an excellent job at balancing the various areas of specialization with the needs of the program (Table 4). All of the faculty have extensive experience teaching introductory biology courses and help cover the heavy service burden associated with meeting the needs of the university for Core Area D. For more information about the individual faculty members of the Biology Department, please refer to their curriculum vitae located in Appendix A of this document.

Table 3. Credit hours generated by Biology Department from fall 2008 to fall 2014.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Lower Division</th>
<th>Upper Division</th>
<th>Total Number Students</th>
<th>Total Credit Hours</th>
<th>Average per Biology Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-2009</td>
<td>2076</td>
<td>476</td>
<td>897</td>
<td>2552</td>
<td>510.4</td>
</tr>
<tr>
<td>2009-2010</td>
<td>2173</td>
<td>443</td>
<td>963</td>
<td>2616</td>
<td>523.2</td>
</tr>
<tr>
<td>2010-2011</td>
<td>2404</td>
<td>535</td>
<td>1032</td>
<td>2939</td>
<td>587.8</td>
</tr>
<tr>
<td>2011-2012</td>
<td>2364</td>
<td>536</td>
<td>1064</td>
<td>2900</td>
<td>580.0</td>
</tr>
<tr>
<td>2012-2013</td>
<td>2481</td>
<td>375</td>
<td>1041</td>
<td>2856</td>
<td>571.2</td>
</tr>
<tr>
<td>2013-2014</td>
<td>2528</td>
<td>382</td>
<td>1068</td>
<td>2910</td>
<td>485.0</td>
</tr>
<tr>
<td>2014</td>
<td>1393</td>
<td>187</td>
<td>592</td>
<td>1580</td>
<td>316.0</td>
</tr>
</tbody>
</table>

*Academic Year 2014 presents only Fall semester and thus reflect approximately 50% of the faculty load.*
Table 4. The faculty of the Biology Department represent a broad range of expertise.

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Rank at GSW</th>
<th>Degrees</th>
<th>Areas of specialization</th>
<th>Courses Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob Herrington</td>
<td>Professor</td>
<td>Ph.D., Washington State University M.S., Georgia College B.A., University of Evansville</td>
<td>Herpetology &amp; Vertebrate Zoology</td>
<td>Comparative Vertebrate Ant.; Natural History—Vertebrates; Herpetology; Human Anatomy and Physiology</td>
</tr>
<tr>
<td>J. Tommy Wright</td>
<td>Professor</td>
<td>Ph.D., Emory University B.S., Columbus College</td>
<td>Molecular &amp; Cellular biology</td>
<td>Developmental Biology; Cell and Molecular Biology; Animal Physiology</td>
</tr>
<tr>
<td>Ian Brown</td>
<td>Professor</td>
<td>Ph.D., University of Otago, New Zealand B.S., University of Otago, New Zealand</td>
<td>Entomology &amp; Ecology</td>
<td>Entomology; Ecology; Genetics; Aquatic Biology</td>
</tr>
<tr>
<td>Stephanie G. Harvey</td>
<td>Professor</td>
<td>Ph.D., The University of Tennessee, Knoxville M.S., Georgia College &amp; State Univ., Milledgeville B.A., Wesleyan College, Macon Georgia</td>
<td>Plants &amp; Plant ecology</td>
<td>Advanced Botany; Economic Botany; Field Botany; Biological Resources; Plant Physiology, Applied Botany</td>
</tr>
<tr>
<td>Anh-Hue Tu</td>
<td>Associate Professor</td>
<td>Ph.D., Texas A&amp;M Health Science Center B.S., Baylor University, Waco, Texas</td>
<td>Bacteriology &amp; Molecular Biology</td>
<td>Bacteriology; Microbiology. Advanced Bacteriology</td>
</tr>
<tr>
<td>O. Tom Lorenz</td>
<td>Assistant Professor</td>
<td>Ph.D., University of New Orleans M.S., Southeastern Louisiana University B.S., Western Michigan University</td>
<td>Ichthyology, Vertebrate Zoology &amp; Animal Behavior</td>
<td>Human Anatomy and Physiology. Ichthyology. * Animal Behavior *</td>
</tr>
</tbody>
</table>

*Subject taught as Special Topics but currently under development as a course.
Assessment of the Biology Department & Program

CORE Area D Assessment

For three years, Biology has been collecting data for the assessment of Area D of the CORE. The introductory classes that fulfill this CORE area include: BIOL 1107/1108 (non-majors biology I/II), BIOL 2107/2108 (majors biology I/II) and BIOL 1500 (Applied Botany). Instructors of these course add an assessment instrument into the course’s last exam. The instrument consists of questions that allow the evaluation of the student’s ability to (1) interpret graphical data, (2) evaluate relationships from the graph and (3) predict relationships from the graph. Figure 1 summarizes the results from over the last three years.

![Figure 1. Area D - Core Assessment by year. This shows the percentage of students in each class that responded correctly to the questions evaluating the interpretation, relationships, and predictions of a graphical model.](image)

The drop in scores on the “prediction” element was surprising and may be an artifact of fewer students being assessed. This will continue to be tracked to see if it is an anomaly or if the issue needs to be addressed.

Assessment of the Biology Program

In keeping with the mission of the Biology Department six critical Student Learning Outcomes (SLO) were identified for the Biology Program: 1) Students should be able to demonstrate a knowledge of biological principles; 2) Students should be able to understand and demonstrate the use of scientific equipment used in both the lab and field; 3) Students should be able to apply major biological concepts; 4) Students should be able to evaluate scientific information; 5) Students should be able to communicate scientific knowledge; 6) Students should be able to create and execute a scientific experiment. Assessment of these SLO is primarily handled in the capstone sequence of BIOL 4010A and 4010B. The sequence
requires the creation and execution of original research projects during which faculty work one-on-one with juniors and seniors. The completion of this sequence also requires the students to take the ETS Major Field Exam. Other check points such as Ecology (BIOL 4050), which is required of all students and includes a research paper, provide the opportunity to compare cohorts throughout the program. The target is to have 70% of Biology graduates to meet the expectations of all SLO and to score within 90% of the mean National Scores on the ETS.

The ETS Biology Major Field Test was developed to assess mastery of concepts, principles and knowledge of graduating Biology students along with their analytical skills. Over 1500 colleges and universities use this exam and thus it allows GSW Biology majors’ scores to be compared to national means. The exam is organized into four major areas: cell biology; molecular biology and genetics; organismal biology; and population biology, evolution and ecology.

The mean ETS score for GSW Biology majors since Fall 2008 is $153.2 \pm 10.46$ (Appendix C) which is up slightly from the prior CPR period ($150.61 \pm 10.79$). This is the same as the national mean ($153.2 \pm 13.3$; ETS, 2014). The sub-scores were also not statistically different from the national sub-scores (Figure 2). Based on these data, SLO-1 and SLO-3 are realized by the Biology graduates.

![Figure 2](chart.png)

Figure 2. A comparison of the sub-scores from the ETS amongst the current study period – GSW 2008-2013, GSW prior to 2008 and the national means for 2014.

While averaging across the last six years shows GSW Biology majors achieving scores comparable to the national average, a closer look at the data is even more compelling. Comparing the ETS data for GSW Biology majors from year to year, there is a trend toward higher scores (Figure 3). For the Fall 2013, the student average at GSW exceeded the national mean subscores (53.2, 53.0, 53.2 and 52.7, respectively).
Biology 4050, Ecology, is a required course for all Biology majors and therefore provides the department with another opportunity to assess several of the Biology program’s SLO. One assignment was selected for use as an assessment tool. Students are required to research, design and implement a small scientific experiment. The student collects data, analyzes the data and draws conclusions. The assignment culminates in a presentation and paper. Based on the submitted paper and the class presentation, students are assessed on their ability to: SLO-2) understand and demonstrate the use of scientific equipment used in both the lab and field; SLO-4) Students should be able to evaluate scientific information; SLO-5) Students should be able to communicate scientific knowledge; and SLO-6) Students should be able to create and execute a scientific experiment.

From Spring 2009 to Spring 2014, 77 students were accessed and 88.3 % were found to meet or exceed the expectations for the above SLO (Figure 4.) The students that did not meet expectations also performed poorly in the course overall and often repeated the course the next year. These students were counted each time they attempted the assignment.

The Biology Seminar series (BIOL 4010A and B) is the Biology program’s capstone. In the first semester, a student collects literature about a topic of interest and develops a research project with the help of a
By the end of the first semester the student has a draft of his/her literature review and a design for his/her original research to implement. By the end of his/her second semester, the student should have completed the experiment, collected the data, analyzed the data and drawn conclusions. A journal-styled paper is composed and submitted to the Biology faculty for consideration. All students present their research in an open class meeting before the entire Biology faculty. Both the paper and presentation is evaluated as a component of the program assessment, specifically to address SLO-2) understand and demonstrate the use of scientific equipment use in both the lab and field; SLO-4) Students should be able to evaluate scientific information; SLO-5) Students should be able to communicate scientific knowledge; and SLO-6) Students should be able to create and execute a scientific experiment.

For the academic years analyzed for this CPR, the target of 70% of Biology majors meeting expectations was well exceeded (Figure 5). The lowest year, 2013-2014, had a single student fail to meet the objectives but due to the smaller class size that year it has a greater influence on the reported values.

Of course another aspect that can be observed to determine the success of the Biology program concerns the outcomes following graduation. Over the past six years, 60 students have graduated from the Biology program and have been very successful as a group. Twenty-seven of the graduates continued their educations by pursuing higher degrees. Fourteen graduates were successfully admitted to professional programs including medical school, veterinary school, dentistry school and pharmacy school. Thirteen graduates were admitted into graduate programs, two of which entered Ph.D. programs. Other students
are working in industry (eight) and positions in the medical field (seven). Four students are conducting laboratory/field research while several are teaching high school sciences.

Figure 5. The percentage of students that met the expectations for SLO-2, (understand and demonstrate the use of scientific equipment used in both the lab and field), SLO-4 (Students should be able to evaluate scientific information), SLO-5 (Students should be able to communicate scientific knowledge), and SLO-6 (Students should be able to create and execute a scientific experiment) for the years Fall 2008 to Spring 2014.
Assessment Based Changes

Addressing Deficiencies Noted in ETS Exam:

Several changes have been implemented based on various assessment tools since the last CPR in 2008. One of the changes was based on the lower scores in the “Ecology, Evolution and Population Ecology” subsection of the ETS exam. The lack of an evolution course in the curriculum was assumed to be a contributing factor. Ways to have more of an impact in this area were considered including hiring someone with expertise in this area. But that seemed unlikely so alternative options were developed.

The first step was to introduce the topic to students in BIOL 2108. There was no way to add this into the existing lecture schedule, so a “self-study” component was added to the course. The students are assigned to read the chapters on evolution and then take on-line quizzes associated with each chapter. The students have the entire semester to complete the five chapters.

The second approach has been to offer Special Problems Courses on Evolution. Dr. Bob Herrington offered a two-hour course Fall 2008. The department hopes to be able to expand on this with courses on different aspects of evolution and hope to take advantage of other faculty members who have some expertise in this area.

Analysis of the data from 2008 to 2013 shows a trend toward higher scores on the subsection that contained the evolution component ($r^2=0.64$). In Fall 2013, the students averaged 62 which was higher than the national mean score of 52.3.

Identifying Freshman Biology Majors in Peril

One area identified by Biology faculty that needs attention within the Biology program is the high failure/withdrawal rate of freshman majors in BIOL 2107—Principles of Biology I. Each Fall Term, 30-50 freshman declare a Biology major (Cooper, 2014a). Few of these students understand how different the program is from the biology course(s) they took in high school and they are woefully unprepared for the challenges. As a result, the percentage of students successfully completing BIOL 2107 is low. For example, in 2006 only 39.8% (GSW Banner, 2014) of the students in the course successfully completed it. Overall, the faculty is less concerned about the retention of these students as majors, and more concerned that the student’s experience in BIOL 2107 will color his/her view of college and potentially leave him/her with an “F” on his/her transcript. On average, over 50% of the freshmen declaring Biology majors will change majors within their first year at GSW (Cooper, 2014b). Biology faculty would like to minimize the potential trauma by screening the freshmen and placing those students at risk of withdrawing from or failing BIOL 2107, into a course that will provide: a) a stronger foundation in biology for students that do remain Biology majors and b) for students that determine the Biology program is not a good fit for them, a course that will count toward any degree on campus (BIOL 1107). The first step toward this goal was to determine a method to identify “at risk” Biology majors. After analysis of various incoming freshmen data for correlations with success in BIOL 2107, the best correlation was with the “math placement test.”
To keep things simple, students who did not test into College Algebra (later, this changed to not being required to register for the Math Lab) were diverted from BIOL 2107. Instead, they were placed in BIOL 1107, the biology course for non-biology majors. It was hoped that taking this course would provide students with a stronger foundation in biology before they attempted BIOL 2107. Biology majors placed in the non-major biology could progress through both BIOL 1107 and BIOL 1108 (with labs) and have credit toward the Area D – science sequence requirement. Thus the credits were used to complete a CORE requirement. If a student was particularly successful in BIOL 1107, they were given the option to register for BIOL 2108 in the spring. Those majors that struggle in BIOL 1107 quickly realize that the Biology program is not for them and change majors. For these students, the BIOL 1107 course can also count in Area D, so again credits are not wasted and they have a grade that is significantly higher than what they would have most likely received in BIOL 2107.

In Fall 2008 this plan was implemented. Fifty-two (52) entering freshmen declared Biology majors (including all tracks) but only 27 qualified to enter BIOL 2107. Of the 25 students placed in BIOL 1107 due to their low math placement scores only two (2) remained Biology majors and to date only one of those students has successfully completed the B.S. in Biology. Thus of the 28 students that changed their major, 23 were captured in that diverted group and most successfully completed the BIOL 1107. Based on the results from 2008, it was decided to continue this screening process. For the last six years the results have been relatively consistent (Table 5).

<table>
<thead>
<tr>
<th>Year (Fall Term)</th>
<th>Entering Freshmen Majors</th>
<th>Did not Meet Math requirement</th>
<th>Total Students that Changed Major</th>
<th>Retained Majors from BIOL 1107</th>
<th>% of Students Identified that Changed Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>52</td>
<td>25</td>
<td>28</td>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>2009</td>
<td>35</td>
<td>17</td>
<td>15</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2010</td>
<td>43</td>
<td>18</td>
<td>30</td>
<td>2</td>
<td>53</td>
</tr>
<tr>
<td>2011</td>
<td>37</td>
<td>14</td>
<td>21</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>2012</td>
<td>41</td>
<td>22</td>
<td>28</td>
<td>0</td>
<td>79</td>
</tr>
<tr>
<td>2013</td>
<td>32</td>
<td>20</td>
<td>-*</td>
<td>4</td>
<td>-*</td>
</tr>
</tbody>
</table>

* Data not available at time of analysis.

It should be noted that overall Biology’s retention of majors from freshman year to sophomore has dropped under this plan. However, in years prior to this procedure, students would not change their major even after failing BIOL 2107. This problem occurred as students would try to retake the course the following year to replace their “F”s with better grades. Many would take it several years before finally passing or giving up. Eventually these student do change their major but the time spent retaking BIOL
2107 slowed their progress in their new field of study. Under this plan, if they are placed in BIOL 1107, they are not tied to retaking the BIOL 2107 and thus are more likely to make the shift to a new major within that first year. This plan has not impacted retention of these students by the University (a mean of 68.8% for the past 6 years; Cooper, 2014b).
Current and Ongoing Assessment Activities

The assessment data for the General Education – Core Area D will continue to be collected. Dr. Stephanie Harvey is currently the individual responsible for collection, analysis and reporting of this information. The report is forwarded to Dr. Bryan Davis, Director of Institutional Effectiveness and Planning.

The ETS Major Field Test in Biology will continue to be required for all Biology majors and added to the 12 consecutive years of data. The exam provides information that allows the department to identify strengths and weaknesses within the program in regard to content areas. The data are used to measure student achievement on SLO-1 (Students should be able to demonstrate a knowledge of biological principles) and SLO-3 (Students should be able to apply major biological concepts). The exam is relatively affordable ($27 per student) as compared with the GRE subject test ($150). Dr. Stephanie Harvey is currently responsible for the collection, analysis and reporting of this information in Annual Reports.

The department will continue to use the Ecology project as a tool for early indication of student achievements in regards to the program SLO. Some changes will be made as to how this artifact will be assessed. The department will meet and develop a standardize rubric that will provide more insight into where students are falling short.

The capstone seminar sequence will remain as the primary tool for assessing the following SLO: SLO-2) understand and demonstrate the use of scientific equipment use in both the lab and field; SLO- 4) Students should be able to evaluate scientific information; SLO-5) Students should be able to communicate scientific knowledge; and SLO-6) Students should be able to create and execute a scientific experiment.

Starting in Fall 2015, GSW will no longer use the Math Placement Test to determine if students are required to take the Math Lab along with College Algebra. Since this score was the basis for the identification of the “at risk” freshmen Biology majors, a new tool will have to be identified. Several ideas have been suggested. One option would be to require a biology placement exam. This might provide the best identification but it creates several problems. One of the main cons for this method is that it would preclude students registering for courses until they have taken the exam. In fact, this delay was one of the reasons for eliminating the Math Placement Test. For Fall 2015, the department will try the simplest solution which is the use of the same indices that the academic office will use for placing students into College Algebra with or without the Math Lab.

Regardless of the success of using the indices, the department will also be looking into an alternative that may help even more students. The basic idea is to allow students to ‘flip’ from the BIOL 2107 into a concurrent BIOL 1107 class if they are struggling up through the first exam. After the first exam, students would be given the option to change to BIOL 1107 without penalty. The two classes cover the same material but at very different depths, so students that flipped would not have missed any materials. If a drop grade is included in the grading scheme for the BIOL 1107 class, a student’s grade would not suffer from the poor test score in BIOL 2107.
This plan would have to have the approval of the registrar since the class change would be after drop/add. Additionally a section of BIOL 1107 would have to be scheduled at the same time as BIOL 2107 so that students could transition without conflict in other courses. Currently it would be difficult to do in the Biology facilities; the course would have to move to another building due to the small size of most of the classrooms. This would also require designating a faculty member to a section that starts the semester off empty only to gain 30 to 45 students 4 weeks into the term. If these difficulties can be overcome, this may be the best solution to a growing problem. There would be no need to pre-identify the students; they would self-identify during the first four weeks of the major’s course.
Changes to the Program or Department

Program Change Based on Student Aspirations

Prior to the academic year 2013-2014, the B.S. in Biology required students to take one upper division chemistry course beyond the Organic II course. Often students, particularly those applying to medical schools, take Biochemistry. However, not all students are suited for Biochemistry or other upper division chemistry courses. For students entering graduate programs in areas that require field work, exposure to other sciences, such as geology, is more beneficial. For this reason, the department changed the requirement to include the 3000+ Geology courses as options for this requirement (Appendix D). This will result in fewer students taking an additional chemistry, but will not weaken the program. Multiple programs in the state don’t require Biology majors to have any chemistry beyond Organic II, and some only require Organic I. A few students have used this option since it was implemented and have remarked on the usefulness of courses such as GEOL 4611 - Introduction to GIS.

Changes in Faculty

In Fall 2013, Dr. Tom Lorenz was added to the instructional roster as an Assistant Professor in Biology. His addition to the teaching pool has been well received. Biology was able to increase the offering of service courses, and offer those courses off sequence. He was also able to add a special problems course Spring Term 2014 on Fish Biology and will offer a special problems course in Animal Behavior Spring 2015.

Dr. Bob Herrington stepped down as Chair of Biology at the end of the 2013-2014 year. Dr. Stephanie Harvey was appointed as the new Chair starting with the Academic Year 2014-2015.

New Courses

Dr. Ian Brown has worked closely with The Parks at Chehaw to introduce several students to the study of Zoo Biology. The class has been offered with great success as a special problems course. Several of these students have either become employed or are volunteering at the facility and there is a potential to increase the service learning in the department. Dr. Brown is currently working on a course proposal to add Zoo Biology to the GSW course catalog.

Over the past few years we have offered several special problems courses in a variety of areas. These courses are typically 2 hours credit and allow students to squeeze them into already tight schedules. Several of these courses will be proposed as new courses for the course catalog so that they may be offered on a more regular basis. Two of these special problems courses were offered by Dr. Tu. Bioethics was piloted as a special problems course for several May terms. Her newest offering is Nutrition for Healthy Living which was designed and delivered as an on-line course.

Dr. Harvey designed and offered BIOL 1500 – Applied Botany as an on-line Area D non-lab science course in Spring 2012. Due to changes in the learning management system, the on-line version of the class was not offered for the past few years. It is on the schedule for Spring 2015.
Other Changes and Additions

The new greenhouse was completed just before the start of the Fall 2013 term. This structure is a good example of a conventional greenhouse (unlike the one it replaced). It includes a traditional climate control system that allows use of the house throughout the summer. The house is also ADA compliant with ramped entrance and wheelchair accessible rows.

Adjacent to the Roney building, on the north side, are several experimental mesocosms. These include two large (7 foot by 14 foot) ponds that are about 2.5 feet deep, as well as 15 other premade cattle tanks of 110 gallons and 300 gallons. These mesocosms are designed for a variety of experiments, including several that have already begun for senior seminar projects in biology (on invasive crayfish behavior). The mesocosms were funded by a Faculty Instructional Grant awarded to Dr. Tom Lorenz in the Spring of 2014 and were constructed by him and several Biology students.

Dr. Harvey created a “Biology Portal” in GaView. The goal of this portal is provide a digital handbook for Biology majors. It can serve as a central hub for communicating with the majors. The portal is still a work in progress but the department hopes it will provide students with information that will help them successfully complete their degree.

The GSW Herbarium, the fifth largest in the state, has begun a digitization process that will provide worldwide access to the Norris collection. As part of this process, a new computer was purchased with year-end money. The digital collection can be accessed via web searches on specific specimens or via the SERNEC (Southeastern Regional Network of Expertise and Collections) portal at http://www.sernecportal.org/portal/. Dr. Harvey, as co-curator, submitted the herbarium as a participant in a funded NSF Grant. The budget details are still being worked out but this should help the project move forward.
Citations & Acknowledgements

Citations


Cooper, Lisa. 2014a. First Year Freshmen Fall enrollment by Major. GSW Institutional Research.

Cooper, Lisa. 2014b. First Year Freshmen Fall Retention by Major. GSW Institutional Research.

GSW Banner. 2014. Accessed by Dr. Stephanie Harvey.

Acknowledgements:

Thanks to all the Biology Faculty and Debbie Standridge for their help in the composition of this document. Additional thanks to Dr. Lisa Cooper for the data she provided.
Appendix A – Curriculum Vitae

- Ian Brown, Ph.D.
- Stephanie Harvey, Ph.D.
- Robert “Bob” Herrington, Ph.D.
- Otto “Tom” Lorenz, Ph.D.
- Anh-Hue Tu, Ph.D.
- J. Thomas “Tommy” Wright, Ph.D.
Ian M. Brown

Last updated: 10/12/2014

Education:
1990 Masters of Science converted to Ph.D. - Cold tolerance of the Antarctic Nematode *Panagrolaimus davidi* University of Otago, Dunedin, New Zealand.
1987 Bachelor of Science Zoology major. University of Otago, Department of Zoology, Dunedin, New Zealand.

Relevant Work Experience:
08/2013 – Promoted to Professor Georgia Southwestern State University
08/2007 - Tenured Georgia Southwestern State University
08/2006 - Promoted to Associate Professor, Biology, Georgia Southwestern State University
05/2004 - Graduate Faculty Georgia Southwestern State University
2002-06 - Assistant Professor, Biology. Georgia Southwestern State University

Publications and Conference Talks 2007-2014:
Shapiro-Ilan D.I. and Brown I., (2013). Earthworms as Phoretic Hosts for *Steinernema carpocapsae* and *Beauveria bassiana*: Implications for Enhanced Biological Control. Biological Control 66: 41-48

Research in progress:
Entomopathogenic Nematode Cryopreservation
Earthworms as Phoretic Hosts for Entomopathogenic Nematodes and Fungi
Crayfish Ecology and Behavior
Cold Tolerance of the Halloween Lady Beetle *Harmonia axyridis*

Student Research Talks


Crosby C., Brown I., Entz J., Albrighton D. (2013). Gopher Tortoise Research used as a Teaching Tool at Chehaw Park and Zoo Georgia Southwestern State University, Chehaw Park Authority. 35th Annual Gopher Tortoise Council Meeting, October 10-13th, Ponte Vedra Beach, FL
Grants and other funding:
Brown, I. (2007) Distinguished Professors Grant. Georgia Southwestern State University. $5000.00
Brown I (2007) Faculty Development Grant Georgia Southwestern State University. $679.55
Peavy S., and Brown, I. (2009) Distinguished Professors Grant. Georgia Southwestern State University. $2550.00
Brown I (2010) Faculty Development Grant Georgia Southwestern State University. $314.00
Brown I (2012) Faculty Development Grant Georgia Southwestern State University. $500.00
Brown I (2014) Faculty Instructional Grant Georgia Southwestern State University. $700.00

Workshop Participation
Georgia Adopt A Stream Train the trainer Workshop 07/2009
Georgia Adopt A Stream Train the trainer Workshop 07/2010
Georgia Adopt A Stream Train the trainer Bacterial Workshop 12/2010
American Academy for Future Teachers 06/23-30/2011
Georgia Adopt A Stream Train the trainer Workshop 07/2011
Georgia Adopt A Stream Train the trainer Workshop 07/2012

Conference Attendance:
XLth Annual Meeting of the Society for Invertebrate Pathology, Quebec, Canada. Aug 12-16th 2007
Georgia Entomological Society Meeting Veterans Park GA 04/7-8/2011
Georgia Entomological Society Meeting Statesboro GA 04/4-6/2012 (Student paper given)

Professional Society Membership:
Society for Nematologists
Society for Invertebrate Pathology
Entomological Society of America
Georgia Entomological Society
Georgia Mosquito Control Association

Other Activities:
Gama Beta Phi Academic Advisor 2003-present
ViceChair of the Lake Blackshear Watershed Association 2008
Chair of the Lake Blackshear Watershed Association 2009
Lake Blackshear Mosquito Control 2003-present
Georgia Mosquito Control Association, Board of Directors, 3 year director 2010, 2year director 2011, 1year director 2012, Vice President 2013, President 2014.
Stephanie Gail Harvey
Curriculum Vitae

EDUCATION:

University of Tennessee, Knoxville 08/98 – 08/02
Department of Plant and Soil Sciences GPA: 3.95
Degree: Doctor of Philosophy Plant & Soil Science - Crop Ecology & Physiology
Major Professor: Carl E. Sams
Dissertation: Glucosinolates, Isothiocyanates, and Biofumigation: a potential alternative for controlling soilborne pests.

Georgia College & State University, Milledgeville, GA. 09/93 - 12/97
Degree: MS Biology Botany & Ecology GPA: 4.00
Major Professor: Harriett Whipple

Wesleyan College, Macon, GA. 08/88 - 05/92
Degree: BA Biology Cum laude GPA: 3.64

WORK EXPERIENCE-Academic Work Experience:

Professor & Chair of Biology:
Georgia Southwestern State University, Americus GA 31709 08/02-Present
Department of Biology Supervisor: Kelly McCoy
Primary Responsibility – General Biology & Botany Courses

BIOL 1107: Essentials of Biology I Average Class Size: 75
A survey of the principles of modern biology including cell structure and function, respiration and photosynthesis, gene structure and function, genetics, evolution, the diversity of living things.

BIOL 1107: Essentials of Biology I LAB Average Class Size: 25
This laboratory class complements the BIOL 1107 lecture.

BIOL 1500: Applied Botany Average Class Size: 15
This course is designed to provide the non-biology major with an introduction to vascular plant anatomy and basic life processes and with plants of the world that have horticultural interest. Also designed and taught as an ONLINE course

BIOL 2108: Principles of Biology II (in part) Average Class Size: 50
A two-semester sequence designed to give pre-health professional students and biology majors the basic fundamentals of biological sciences. Class includes a weekly three-hour lab component.

BIOL 3000: Advanced Botany Average Class Size: 25
An introduction to the anatomy and morphology of organisms traditionally considered plants with an emphasis on how anatomy and morphology reflect the phylogenetic relationships within the Kingdoms Monera, Plantae, and Fungi. Class includes a weekly two-hour lab component.

BIOL 3300: Economic Botany Average Class Size: 25
An introduction to the uses of plants and plant products by humans. Labs provide hands-on experience with topics including plant gums and resins, essential oils, fibers, dyes, spices, and staple plant foods from around the world. Class includes a weekly two-hour lab component.

BIOL 3710: Field Botany Average Class Size: 25
An introduction to the local flora, particularly flowering plants, with an emphasis on field recognition, family composition, terminology and the use of keys

BIOL 4100: Biological Resources Average Class Size: 15
This course provides upper division students with the computer and research skills necessary to excel professionally in biology and related fields. Also designed and taught as an ONLINE course.

**BIOL 4300: Plant Physiology**

Average Class Size: 20

An introduction to the life processes of plants with an emphasis on angiosperms. Topics include water relations, mineral nutrition, control of growth and development, and the biochemistry of photosynthesis with a brief consideration of plant "secondary" metabolism. Class includes a weekly three-hour lab component.

**BIOL 4750: Special Problems – Environmental Sustainability**

Average Class Size: 9

This course explores sustainable agriculture including, but not limited to, biological control of plants, fungi and invertebrates, and the principles of integrated pest management.

**BIOL 4750: Special Problems – Ecology of the Okefenokee Swamp**

Avg Class Size: 12

This course explores the ecology of the Okefenokee Swamp in southeast Georgia. Topics include but are not limited to: geology, chemistry, flora and fauna of the swamp and man's impact on this natural system.

**ISCI 2001: Life and Earth Sciences for Teachers**

Average Class Size: 30

This course is an integrated science course for Early Childhood Education students. This is a lecture course with an integrated lab component. Topics include: characteristics of life, interdependence of life, biodiversity, heredity, energy flow, cell structure and function, earth systems, lithosphere, hydrosphere, and the biosphere. Meets for 4 hrs / week with integrated labs.

**Course Design:** Designed classes for on-line delivery

- **Biological Resources** – Online course with audio lectures that accompany PowerPoint presentations.
- **Applied Botany** - Online course with audio lectures that accompany PowerPoint presentations. Integration of Service Learning into both face to face class and online class.

**WORK EXPERIENCE - Research Experience:**

**Georgia Southwestern State University, Americus Georgia 31709**

2002 to Present

- Associate Professor (Fall 2007 to present; Assistant Professor 2002 to Fall 2007)

1. Digitizing of the GSW Herbarium using the **Symbiota** portal.
2. Co-chaired development of QEP
3. Developing research projects for students
4. Studying traditional phenotypic markers in **Gossypium** species.
5. Development of online science courses; use of service learning in courses

**WORKSHOPS AND CONFERENCES ATTENDED:**

- **iDigBio Digitizing Plant Collections Workshop**
  - September 16-18 2012
  - The primary goal of these workshops is to prepare participants with the necessary skills and knowledge to launch or maintain a digitization program individually, through collaboration with an existing Thematic Collections Network (TCN), or through collaboration with iDigBio. The target audience includes collections managers, curators, and herbarium directors. Invitation only.

- **USG Faculty Training for D2L**
  - Fall 2012
  - Multiple delivery formats and many sessions were offered: General overview, Quiz Tool, Building a Course; Assessment Tools.

- **USG Faculty Development Workshop**
  - March 30 2012
  - “Class from Hell” – strategies for handling classroom management problems.

- **Georgia Herbarium Consortium**
  - February 24-25 2012
  - At Valdosta State University, Valdosta Georgia.

**CONFERENCE PRESENTATIONS & SEMINARS:**
• Classification and Taxonomy of Plants. National Garden Club of America Study Course. Plains, GA - March 2014
• Windows to the World. QEP Topic Presentation. Georgia Southwestern State University Faculty Development Week. 8/13
• A Comparison of the Antibacterial Properties of Extracted Allyl Isothiocyanate 10/11
• Efficacy of Brassica Biofumigation in Tomato Production. (in absentia) Second International Biofumigation Symposium, University of Idaho, Moscow, Idaho 11/07

PUBLICATIONS, REVIEWING & AUTHORING:

• Economic Botany. Review of a proposed textbook for Cambridge University Press. 2013

ACADEMIC SERVICE:

At Georgia Southwestern -

Director of the Teaching Circle Program 2010 - present
Chair of Biology Department 2014 - present
Co-Chair QEP Development Committee 2012 - 2014
SACS-COC Compliance Steering Committee 2011 - 2014
QEP – Submission of proposal and presentation as a finalist 2012 - 2014
Authored Draft of Distance Education Policy 2012
Committee Work:
Faculty Senate 2008/2010
Graduate Faculty Affairs 2007/2009
STEM Committee 2009-2011
Teaching Circle - General Interest Group Organizer 2006 - present
Teaching Circle Coordinator for D2L TC 2012-2014
Reorganization Committee 2006/2007
Search Committee - Biology Tenure Track 2013
Search Committee - Biology Lecture 2012
Teachers Education Council 2003 -present
Taskforce on Scholarship 2003/2004
Instructional Technology Advisory Committee 2003 - present
University Relations Committee 2002/2003;2013/2014

Other Service to the University:
Scenic Construction for Dramatic Arts 2007-Present
Archival Photographer for Dramatic Arts 2007/2010
Webmaster for Biology Department 2002-present
Advisor of Biology Club 2005-2012
OIIT Designated Departmental Computer Technician 2003-present
Storm Days and Preview Days Numerous

COMMUNITY SERVICE:

Board of Directors for Sumter Players, Inc 2007-present
    President of SPI, Inc 2011-2012
Southwest Civic Chorus 2012 -present
    President/Secretary/Treasurer 2012 -present
Archival Photographer for Sumter Players, Inc 2007-present
Sumter Players & GSW Productions - Cast and Crew many productions
AMBOGS - Vice President 2009 - present

PROFESSIONAL AND ACADEMIC HONORS:

GSW Distinguished Professor Award 10/11
GSW Distinguished Professor Award 06/07

PROFESSIONAL MEMBERSHIPS:

American Society for Horticultural Science
*Tex Frasier Lecture Selection Committee
American Society of Plant Physiologist
Gamma Sigma Delta
Georgia Academy of Science
Alpha Psi Omega
Sumter Players, Inc
Georgia Botanical Society
The Georgia Conservancy
Intl. Society for Horticultural Science
Phi Kappa Phi
Dragon*Con
National Trust
CURRICULUM VITAE

PERSONAL DATA
Name: Robert E. Herrington

WORK EXPERIENCE:

August 2014- Present
**Professor of Biology** Teaching Human Anatomy & Physiology I & II. Biology 1108 + lab. Research interests continue to be vertebrate natural history with an emphasis on local reptiles and amphibians.

August 2007- 2014
**Professor of Biology, Chairman of the Department of Biology.**
Upper division teaching duties have included Comparative Vertebrate Anatomy, Herpetology, Natural History of Vertebrates, and Principles of Biology for majors. We continue to emphasize hands on laboratory sessions for both major and non-major biology students, as well as providing a strong emphasis in field biology through our joint field trips within the biology department. Numerous scientific affiliations and an officer in the Georgia Academy of Science and the Gopher Tortoise Council.

August 2006 – July 2007
**Professor of Biology** – Department of Biology, Georgia Southwestern State University Americus GA. 31709.
Teaching duties have included a two semester sequence of Human Anatomy & Physiology, Natural History of the Vertebrates and Principles of Biology for majors. I served on the search committee for the Dean of Arts and Sciences and the Faculty Affairs Committee. Coordinated with other departmental faculty to organize and conduct three weekend field trips during spring semester, each of which had 20 or more students. I served as Chair of the Research Advisory Committee of the Gopher Tortoise Council.

August 1, 2003 – July 30, 2006
**Professor and Chairman** – Department of Biology, Georgia Southwestern State University, Americus, Georgia, 31709.
Assumed the leadership of the department and had immediate duties in procuring faculty to teach courses scheduled to begin August 19, 2003. New initiatives in the department include a senior thesis requirement designed to more adequately involve students with the processes and procedures of conducting science and to give them more “hands on” experiences. Re-instituted Biol 4750& 4760 as special topics classes to cover areas in the broad field of biology not currently covered by courses. Following a distinguished professor grant during 2002-2003, I have initiated a research project determining the biodiversity of the reptiles, amphibians, and small mammals on the Bowen property on the GSW campus. Students in several courses will get experience
using state of the art electronic instrumentation including radio-transmitters, GPS, and passive integrated transponders.

EDUCATION:

1981 - 1985    Washington State University, Pullman, WA. 99164

1979         Certified Laboratory Animal Technologist
                American Association for Laboratory Animal Science

1975 - 1978  Georgia College, Milledgeville, GA. 31061
                Master of Science in Biology (1978). Principal area of study in Vertebrate Natural History.

1967 - 1970  University of Evansville, Evansville, IN. 47712

PROFESSIONAL SOCIETY MEMBERSHIPS:
Southeastern Naturalists  2003- present

                      Society for Northwestern Vertebrate Biology 2006 - present
                      The Herpetologists League. 1974 - present.
                      American Association of Ichthyologists and Herpetologists. 1974 - 2010.
                      Gopher Tortoise Council 1988 - present.
                      Partners in Amphibian and Reptile Conservation. 1998 - present. Founding Member
                      Southeastern Partners in Amphibian and Reptile Conservation. 2001-present.
                      American Association for Laboratory Animal Science. 1975 - 1982
                      Georgia Academy of Sciences. 1989 - present.

OFFICES HELD:

Chairman, Student Research Advisory Committee, Gopher Tortoise Council, 1989-present.

Councillor- Georgia Academy of Science 2008-2011


President of the Georgia Academy of Science. 2000.

President Elect of the Georgia Academy of Science. 1999.

ABSTRACTS, PRESENTATIONS, and POPULAR ARTICLES


TECHNICAL PUBLICATIONS


During 2012-2013, I spent an inordinate amount of time (~1.5 yrs) working with the Non-Game Division of the Georgia Department of Natural Resources in restricting the laws regarding the harvest and collection of freshwater turtles in Georgia

During 2014, I hope to submit a numbers of small papers on the distribution of local amphibians and reptiles co-authored with Sergio Patitucci (a former biology student that is now a Laboratory Coordinator at Georgia College and State University.
Dr. O. Tom Lorenz, M.Sc., Ph.D.

Current Position                      Current Address
Assistant Professor of Biology        Americus, GA  31709
Georgia Southwestern State University

Education
B.Sc.  (1994) Western Michigan University                    Kalamazoo, MI
M.Sc. (2001) Southeastern Louisiana University               Hammond, LA

Professional Experience
Post Doctoral Researcher – University of New Orleans  January 2010 to August 2013
Part-time instructor – University of New Orleans     January 2011 to May 2013
Part-time instructor – Loyola University of New Orleans  January 2011 to May 2011
Full-time instructor – Southeastern Louisiana Univ.   January 2002 to June 2003

Awards
Board of Regents Fellowship, University of New Orleans 2003-2008
Travel award, Estuarine Research Foundation. August 2005.
CREST Scholar 2006. $3,333 Research Grant for invasive fish research.
(Coastal Restoration and Enhancement through Science and Technology Program)
Sigma Xi Distinguished Graduate Research Award at the Doctoral Level.  UNO College of Sciences
Honors Convocation, April 18, 2007.
Louisiana Department of Wildlife and Fisheries, Co-P.I.: $250,000 Research on invasive tilapia. (2011)

Teaching Experience
Classes taught:
  Introductory Biology I Lecture, Introductory Biology I Lab
  Introductory Biology II Lecture, Introductory Biology II Lab
  Anatomy & Physiology I Lecture, Anatomy & Physiology I Lab
  Anatomy & Physiology II Lecture, Anatomy & Physiology II Lab
  Comparative Anatomy Lecture, Comparative Anatomy Lab
  Environmental Science, Cultural Biology
  Ichthyology Lecture and Lab/Field component
  Senior Seminar for research
  University 1000 for incoming freshmen

Summer 2003 to 2009:  Upward Bound instructor /Math & Science Upward Bound mentor

Independent student studies:
Spr 2003: (SELU) Methodology for mark and recapture of reptiles and amphibians (3 students)
Spr 2003: (SELU) The influence of behavior on sex determination in African cichlids (2 students)
Fall 2012:  (UNO) Vertebrate behavior studies (1 student), Vertebrate comparative anatomy (1 student)
Spr 2013:  (UNO) Vertebrate ecology studies (3 students)
Fall 2013:  (UNO) Invasive species ecology (3 students)
Fall 2014:  (GSW) Invasive crayfish behavior (3 students)
Committee member: Ph.D graduate students Angela Williamson (UNO), Patrick Smith (UNO)

**Selected presentations** (*indicates presenting author, ** indicates student author)


Lorenz, O.T.*(2012)* “Year-long absence of an invasive species in Louisiana: current status of introduced tilapia” Gulf & South Atlantic Regional Panel on Aquatic Invasive Species. New Orleans, LA.


Lorenz, O.T.*(2011)* “Results of post-rotenone treatment monitoring for introduced tilapia (*Oreochromis
spp.) in the Port Sulphur region. “ Louisiana Chapter, American Fisheries Society, Baton Rouge, LA.

Lorenz, O.T.*(2010) “Behavioral and Physiological Evaluations of Invasive Cichlids in Louisiana” Louisiana Chapter, American Fisheries Society, Baton Rouge, LA.


Lorenz, O.T.*(2009) “Measuring the impact of an invasive cichlid in New Orleans” Spring meeting Southern Division, American Fisheries Society, New Orleans, LA.


Lorenz, O.T.* (2007) “How have cichlids disrupted the condition and food web positions of native fishes?” Coastal Restoration and Enhancement through Science and Technology (CREST) symposium. New Orleans, LA


Peer Reviewed Publications


Lorenz, O.T. and Kaintz, M.A. Effectiveness of rotenone on tilapia at different life stages under simulated environmental conditions (in prep)


Professional Memberships
American Society of Ichthyologist and Herpetologists
Society for the Study of Amphibians and Reptiles
Society for Conservation Biology
American Cichlid Association
North American Native Fishes Association
American Fisheries Society

Journal Reviewer
Environmental Biology of Fishes
Transactions of the American Fisheries Society
ANH-HUE TU, Ph.D.

EDUCATION

Doctor of Philosophy – Medical Sciences-Texas A &M University  Graduated 12/1994
Bachelor of Science – Chemistry-Baylor University  Graduated 05/1987

PROFESSIONAL EXPERIENCE

TEACHING EXPERIENCE:

Associate Professor – Department of Biology  08/2008 - Present
Georgia Southwestern State University

- Taught general biology, microbiology, bacteriology, and advanced bacteriology to nursing, allied health and pre-professional students.
- Serve as research advisor on senior seminar projects.
- Work collaboratively with other faculty, departments and divisions on course development, recruitment, hiring, and retention efforts.
- Improve instructional quality by reviewing and utilizing innovative methodologies, techniques, and delivery methods such as collaborative learning, learning communities, service learning, instructional technology, and distance education.
- Evaluate students by a variety of means to measure their progress in achieving course objectives and inform them in a timely manner of their progress.
- Maintain professional relationships with students, colleagues, and the community.

Assistant Professor – Department of Biology  08/2004 – 5/2008
Georgia Southwestern State University

Adjunct Professor – Science Department  01/2004-05/2004
Jefferson State Community College

Microbiology instructor –Department of Biology  01/1997-05/1997
University of Alabama at Birmingham

RESEARCH EXPERIENCE:

Research Assistant Professor, Department of Genetics  04/1999-2004
University of Alabama at Birmingham

Postdoctoral Fellow, Department of Microbiology  04/1997-04/1999
University of Alabama at Birmingham
Anh-Hue Thi Tu

Postdoctoral Fellow, Department of Microbiology
University of Alabama at Birmingham 09/1994-04/1997

Graduate Student, Department of Biochemistry and Genetics
Texas A & M Heath Science Center 08/1988-08/1994

PUBLICATIONS

Web-based publications (refereed)


Published Microbiology resources and protocols


Conference presentations and publications


Professional awards and recognition

Faculty Instructional Grant – 2013 - $1368
Faculty Instructional Grant – 2012 - $1500
Featured Scholar Award – 2011
Faculty Development Grant – 2009 - $500
GSW Most Valuable Professor - 2009
Kings Fund Grant 2008 - $1500
Faculty Development Grant – 2008 - $800
Distinguished Faculty Award – 2007 - $4500
Early-Career Travel Grant – ASMCUE 2006 - $950
Distinguished Faculty Award – 2005 - $5000

Conference participation
Anh-Hue Thi Tu

ASM Southeastern Branch, 2013
ASM Southeastern Branch, 2011
ASM Southeastern Branch, 2010
ASM Conference for Undergraduate Educator -2008
ASM Southeastern Branch, 2007
ASM Conference for Undergraduate Educators -2006
American Democracy Project: Stewardship of Public Land – 2005
American Democracy Project Civic Engagement Institute – 2005

Workshop and professional participation
Study Abroad Program – Bulgaria – Summer 2014
Advanced Placement Consultant - 2012
Study Abroad Program – Tianjin, China 2011
Study Abroad Program – Costa Rica 2010
STEM Workshop – 2009
STEM AFT Summer Institute – 2009 – Americus, GA
Strategies for Success – 2008 - Atlanta, GA
USG STEM Initiative Institute -2008 - Stone Mountain, GA
ASMCUE Casel Workshop – 2006 – Beverly, MA

Book reviewers
Reviewer of Open Resource Textbook (http://openstaxcollege.org)
Visualizing Human Biology Lab Manual by Jennifer Ellie
Biology by Sylvia Mader

Professional organizations
American Society for Microbiology
International Organization of Mycoplasmology
ASM Southeastern Branch
CURRICULUM VITAE
J. THOMAS WRIGHT

Education
Ph.D. Biology, Emory University, Atlanta, Georgia, 1984.
Dissertation: Isolation and Characterization of Plasma Membrane Proteins and Glycoproteins During Normal and Brachypod Limb Morphogenesis.
B.S, Biology, Columbus State University, Columbus, Georgia, 1979.

Professional Background
1995 - Present
Professor (current rank), Margaret and Russell Thomas Chair, Biology Department
Georgia Southwestern State University

1988 - 1995
Research Physiologist, Animal Physiology Research Unit, Richard B. Russell Agriculture Research Center, United States Department of Agriculture-Agriculture Research Service (USDA-ARS), Athens, Georgia.

1986 - 1988
Postdoctoral Research Associate, Animal Physiology Research Unit, Richard B. Russell Agriculture Research Center, United States Department of Agriculture-Agriculture Research Service (USDA-ARS), Athens, Georgia.

1984 - 1986
Postdoctoral Fellow, Cellular Immunobiology Unit, Department of Microbiology, Pediatrics and Pathology, University of Alabama at Birmingham, Birmingham, Alabama.

Service at Georgia Southwestern State University
Teaching:
Animal Physiology, Pathophysiology, Cell and Molecular Biology, Developmental Biology, General Biology (majors and non-majors), Special Topics-Pathophysiology, University 1000.

Committees & Advisement:
Academic Affairs
Student Affairs
Faculty Affairs
Faculty Advisor for American Medical Student Association (AMSA)
Faculty Representative, Pope Fellows, Rosalynn Carter Institute
Faculty Advisor for Presbyterian Student Center
Served on several PhD Thesis Committees, University of Georgia
Supervised undergraduate students in independent research activities.
Awards/Honors/Other
Organized and served as co-chair of a symposium entitled 'Regulation of Adipocyte Hyperplasia' as part of the 1996 annual meeting of the Society for Experimental Biology Washington, D.C. The Symposium, 'Metabolic Processes in Health and Disease', was sponsored by the American Institute of Nutrition. Also presented an invited seminar entitled 'Flow Cytometric Analysis of Preadipocyte Replication' as part of the symposium.

Recipient of three USDA Certificates of Merit for sustained superior performance in conducting research (1990), sustained outstanding performance in the analysis of adipocyte surface antigens (1992), and for analysis of adipose lineage cells (1994).


Invitations/Presentations
Invited Seminar 'Monoclonal Antibodies in the Study of Adipose Tissue Development in the Fetal Pig', Department of Poultry Science, Texas A&M University, College Station, Texas, 1994


Invited seminar 'Immunological Approach to Studying Adipocyte Differentiation', Dept. of Veterinary Medicine, University of Georgia, 1993.

Invited seminar 'Adipose Tissue Development in the Pig Examined with Monoclonal Antibodies', Eli Lilly Corporation, Greenfield, IN, 1990.

Invited seminar 'Monoclonal Antibodies Against Cell Surface Antigens Expressed During Adipocyte Differentiation', Department of Animal and Dairy Science, University of Georgia, 1990

Invited seminar 'Immunological Approach to Studying Adipose Tissue Development in the Pig', Department of Family and Consumer Sciences University of Georgia, 1990

Refereed Publications


Abstracts


Mateus, C. And J. T. Wright. Identification and isolation of adipocyte membrane glycoproteins. (Abstract, Georgia Academy of Sciences, April, 1997).


APPENDIX B – Course Schedule
## Biology Courses Offered by Term

### Courses offered in Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>Principles of Biology I</td>
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### Courses Offered Intermittently or on Special Schedules

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APPENDIX C – ETS Exam Scores Since 2008
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<td>Fall</td>
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<td>Fall</td>
<td>Starvetsky, Jennifer</td>
<td>160</td>
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Mean Scores: 153.2±10.5  54.3±11.4  51.5±10.5  56.25±11.0  50.2±11.4
APPENDIX D – B. S. in Biology Curriculum Sheet
## B.S. in BIOLOGY

### Effective Catalog Year: 2014-2015

<table>
<thead>
<tr>
<th>CORE: 61 HOURS</th>
<th>MAJOR/ELECTIVE REQUIREMENTS: 59 HOURS</th>
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</thead>
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### Area A (9 hrs) (Min Grade of C Required)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hrs</th>
<th>Term</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>ENGL 1101 Composition I</td>
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<tr>
<td>ENGL 1102 Composition II</td>
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<tr>
<td>MATH 1113, 1120</td>
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</table>

### Area B (4 hrs min)

Select 4 hours from list below:

- LIBR 1101(1), CIS 1000(3), THEA 1110(3), SOSL 1101(3)
- WMST 2001(3), COMM 1110(3), POLS 2401(3)
- ENGL 2200(3), Foreign Lang (2000 or higher)(3)

### Area C (6 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hrs</th>
<th>Term</th>
<th>Grade</th>
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</thead>
<tbody>
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<td>ENGL 2110, 2120, or 2130</td>
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<tr>
<td>Select one:</td>
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<tr>
<td>ARCT 1100, MUSC 1100 or THEA 1100</td>
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### Area D (11 hrs min) Area D Lists

Choose a science sequence from List A:

- Lab Science I
  - Lab (If BIOL or CHEM)
- Lab Science II
  - Lab (If BIOL or CHEM)

Select one:

- 3/4

### Area E (12 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hrs</th>
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<tbody>
<tr>
<td>POLS 1101 American Government</td>
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<tr>
<td>HIST 1111 or 1112 Wtrd Civ I or II</td>
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<tr>
<td>HIST 2111 or 2112 US Hist I or II</td>
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<tr>
<td>ECON 2105, SOCI 1101, PSYC 1101,</td>
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<tr>
<td>HIST 1111 OR 1112</td>
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### Area F (19 hrs)

<table>
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<tr>
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<td>BIOL 2107 Principles of Biology I</td>
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<td>BIOL 2108 Principles of Biology II</td>
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<td>CHEM 1211 Prin of Chemistry I</td>
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<td>CHEM 1212L Prin of Chemistry II Lab</td>
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### Physical Education (4 hrs)

<table>
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<tbody>
<tr>
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<td>PEDS 2000 CPR/First Aid</td>
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<td>PEDS (Activity)</td>
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### Additional Requirements

- GA HISTORY
- US HISTORY
- GA CONSTITUTION
- US CONSTITUTION
- UNIV 1000
- W2W Requirement

### UNIVERSITY POLICIES AND PRACTICES

Minimum grade of "C" required in Area A, Area F and all major courses.
A minimum of 120 semester hours must be completed for graduation.
39 semester hours must be upper division work at the 3000-4000 level.
If MATH 1120 is taken in Area A, the extra hour earned will count in Free Electives.
Hours from Area B plus hours from Area D must equal 15 hours. If more than 15 hours are earned, the extra hours will count in Free Electives.
Affordable hours earned to fulfill PE requirements and UNIV 1000 cannot be used to meet the 120 hours needed for a degree.

### Prior Degree/ Major:

Comments:

Completed by: ___________________ Date: ____________