Review and Assessment of Undergraduate Academic Programs

College of Agriculture and Life Sciences
North Carolina State University

Annual Report for the 2006-2007 Academic Year

Submitted by:
Kenneth L. Esbenshade
Associate Dean and Director of Academic Programs

June 30, 2007
Introduction

The College of Agriculture and Life Sciences has more than 40-degree tracks leading to the bachelors of Science degree. These tracks are offered through 22-degree programs in 15 departments.

The review and assessment of departmental academic programs is a continual and ongoing process consisting of the following elements:

- A comprehensive departmental review every eight years including review and assessment of undergraduate and graduate educational programs. Individuals external to the university that are regarded highly in their disciplinary areas are utilized to review and provide input into departmental programs. The comprehensive departmental review process consists of gathering data, developing a self-study document, reporting to the review team, obtaining a written report from the review team, drafting a departmental response to the written report, and formulating action steps to be taken to address areas of change/needs identified by the review team. The processes and expected outcomes from the comprehensive departmental review program in the College of Agriculture and Life Sciences can be found at http://ceres.cals.ncsu.edu/cfdocs/star/modules/websitebuilder2/WebSite/index.cfm?CurrentWebSiteID=93&CurrentLocation=13.

- Development of objectives, goals and outcomes for each of the 22-degree programs. These statements are integral to the educational mission of the 15 departments that administer the degree programs.

- Annual identification of specific goals for the improvement of the educational process.

- Collection of data and observations that address the specific goals.

- Reflection on the data and observations collected and subsequent alignment of these results with the expected outcomes.

- Change programs to enhance the educational mission within departments.

- Report on an annual basis the assessment and review processes that were conducted that year and any changes that were made to the educational programs.

College-Level Action Plan:

The College of Agriculture and Life Sciences requires departments to undergo comprehensive reviews and to make annual assessment reports. Degree objectives, goals and outcomes are developed during the self-study phase of the comprehensive review process and then reviewed at the succeeding comprehensive review.
Annual assessment reports are required during the years between the comprehensive reviews. Annual assessment reports provide information relative to the activities, which contributed to the degree objectives, goals and outcomes for that year. In addition, annual assessment reports provide a listing of the review and assessment activities that were conducted in the past year and any changes that were made to the academic programs in the department.

The College of Agriculture and Life Sciences collects the annual assessment reports for each of the undergraduate degree programs. A college level report is prepared which provides a summary of the programmatic assessments and changes that were made during that academic year. In addition, administrators in the College of Agriculture and Life Sciences review each annual assessment report to determine whether additional steps should be taken to enhance the effectiveness of the education program. Action plans that are developed at the college level are specific and directed towards a particular degree program.

The 2006-2007 academic year was successful in regards to review and assessment of the academic programs in the College of Agriculture and Life Sciences and many steps were taken to enhance student learning and instructor effectiveness. Departments undertook many assessment processes during the year in an effort to continually evaluate and improve their degree programs. A similar assessment and reporting process is expected next year.

**Summary of Assessments That Were Conducted by Degree Programs During the 2006-2007 Academic Year**

1. Faculty reviewed student-learning objectives in courses they taught.

2. Faculty assessed the effectiveness of various teaching methods in courses they taught.

3. Faculty reviewed and assessed whether students were achieving goals established by programs, particularly as it relates to the development of critical thinking skills, collaborative learning, and the enhancement of communication skills.

4. Faculty evaluated student portfolios to assess student’s progress in the undergraduate major and to ascertain students’ mastery of specific subjects.

5. Formal and informal discussions by departmental committees and/or ad hoc committees were conducted to determine the effectiveness of departmental course content within a discipline and the sequence of courses that comprise an undergraduate degree within the major.

6. Department Heads and/or Undergraduate Coordinators examined numerical scores and individual comments from student course evaluations to assess the
course effectiveness and whether the course is meeting curricular requirements within the major and the effectiveness of the instructor of the course.

7. Department Heads and/or Undergraduate Coordinators reviewed results of the standardized evaluation of advising process to determine the effectiveness of the student-advising program within the department.

8. Department Heads and/or faculty conducted peer evaluation of teaching to determine the teaching effectiveness of faculty, and where appropriate made recommendations regarding improvements.

9. Departmental guidelines were established for first time instructors, which in some cases included mandatory participation in programs in teaching effectiveness conducted by the College and/or University levels, and in other cases were mentored by a more senior faculty member.

10. Department Heads held faculty meetings to discuss departmental course and curricular matters, as well as meetings to ascertain whether the department was meeting their expected outcomes relative to undergraduate education.

11. Department Heads and/or Undergraduate Coordinators conducted personal exit interviews with graduating seniors to assess the perceived level of satisfaction of degree program and whether the program was meeting the overall degree objectives that are established for the program.

12. Department Heads, Undergraduate Coordinators, and faculty solicited feedback from employers to assess whether appropriate subjects were included in the curriculum and to determine whether students graduating from the degree program were prepared for the work force.

13. Evaluation of senior and alumni survey data for purposes of assessing the skills provided within the major for career success.

14. Evaluated the effectiveness of their degree program by the percentage of graduating students who successful passed a standardized exam that is required to work in that field.
The Following Changes Were Made During the 2006-2007 Academic Year As a Result of Assessment Activities

1. The addition of new degree programs
2. Changes in courses within degree programs
3. Changes in degree requirements
4. Changes in student learning objectives
5. Changes in pedagogical approaches
6. Changes in assessment criteria
7. Changes in evaluation instruments and processes
8. Changes in the evaluation processes of instructor/faculty relative to their teaching responsibility
<table>
<thead>
<tr>
<th>Departmental Reports</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS in Agricultural and Environmental Technology</td>
<td>7</td>
</tr>
<tr>
<td>BS in Agricultural Business Management</td>
<td>9</td>
</tr>
<tr>
<td>BS in Agricultural Education</td>
<td>12</td>
</tr>
<tr>
<td>BS in Agronomy – Crop Science</td>
<td>14</td>
</tr>
<tr>
<td>BS in Agronomy – Soil Science</td>
<td>16</td>
</tr>
<tr>
<td>BS in Animal Science</td>
<td>17</td>
</tr>
<tr>
<td>BS in Applied Sociology</td>
<td>21</td>
</tr>
<tr>
<td>BS in Biochemistry</td>
<td>31</td>
</tr>
<tr>
<td>BS in Biological Engineering</td>
<td>34</td>
</tr>
<tr>
<td>BS in Biological Sciences</td>
<td>41</td>
</tr>
<tr>
<td>BS in Criminology</td>
<td>43</td>
</tr>
<tr>
<td>BS in Environmental Sciences</td>
<td>53</td>
</tr>
<tr>
<td>BS in Extension Education</td>
<td>55</td>
</tr>
<tr>
<td>BS in Food Science</td>
<td>57</td>
</tr>
<tr>
<td>BS in Horticultural Science</td>
<td>59</td>
</tr>
<tr>
<td>BS in Microbiology</td>
<td>61</td>
</tr>
<tr>
<td>BS in Natural Resources</td>
<td>63</td>
</tr>
<tr>
<td>BS in Nutrition</td>
<td>65</td>
</tr>
<tr>
<td>BS in Plant Biology</td>
<td>67</td>
</tr>
<tr>
<td>BS in Poultry Science</td>
<td>70</td>
</tr>
<tr>
<td>BS in Turfgrass Science</td>
<td>72</td>
</tr>
<tr>
<td>BS in Zoology</td>
<td>74</td>
</tr>
</tbody>
</table>
Degree Program: B.S. in Agricultural and Environmental Technology

Department: Biological and Agricultural Engineering

Curriculum Code(s): AET

Objectives of the Degree Program:
The objectives of this program are to:
1. Develop technical knowledge of physical and biological sciences used in agricultural and environmental systems.
2. Apply critical thinking, existing technology and practical approaches to solve problems in agricultural and environmental systems.
3. Produce technologists able to work in teams and effectively communicate to audiences.
4. Develop in students an appreciation for life-long education that supports their careers.

Goals of the Degree Program:
The goal is to meet the objectives and measure the outcomes.

Outcomes of the Degree Program:
After completing the B.S. in Agricultural and Environmental Technology, students will be able to:

1. Identify and synthesize appropriate knowledge for the understanding and solution of technical problems.
2. Address agricultural and environmental issues in depth through areas of specialization.
3. Define, analyze and apply the most viable solutions to technical problems.
4. Utilize hands-on approaches in solving problems.
5. Work effectively in teams.
6. Prepare effective written materials.
7. Deliver effective oral presentations to multiple audiences.
8. Search on-line and vocational resources for information appropriate to their work.

Assessment Activity during the 2006-2007 Academic Year:
The BAE Department underwent a comprehensive CSREES review in May 2007 during which assessment results were reviewed. Receipt of the final report is pending. Through the assessment process, several facts quickly became apparent during the year. First of all, current students are successful in meeting the program outcomes and objectives as assessed. Conversations with potential employers and BAE advisory board members revealed the need for AET program graduates, broadly educated individuals capable of solving and managing solutions to technical problems, is high. Unfortunately the current supply of program graduates is insufficient because of low enrollment rate. An effort was initiated to determine the reasons for the enrollment problem, explore
characteristics of similar programs in North America that are more successful in attracting students, and use the information to revitalize the AET program. Findings include the following:

• The current AET program has never been successfully marketed, with the majority of students transferring in from community colleges or other degree programs. When asked why this was the case, current students noted a lack of information. Some cited confusion about the differences between AET and engineering degrees. The BAE advisory committee recommended against use of the word “technology” in the degree title because of a negative connotations with today’s high school graduates. A few students went so far as to say AET was the best kept secret at NC State.

• More successful programs at other institutions focused on agricultural systems management instead of agricultural technology applications. A comparison of program requirements showed that AET required more math, chemistry and physics than almost every other program in North America, and a lower level of biological science.

• Students had difficulty selecting courses for the 15 hours of electives. Transfer students frequently used previously taken courses for these elective hours without considering future career directions.

• The current program was built around production agriculture, with little consideration for other departmental areas of strength: bioprocessing and environment systems. Growth in bioprocess-based industries and environmental programs in North Carolina offer significant employment opportunities for program graduates.

• The state of North Carolina is moving toward the requirement of a four-year degree for licensed professional land surveyors. Unfortunately, no such degree program currently exists in the state. While the review process was underway, we were approached by the North Carolina Society of Surveyors and asked to consider offering a B.S. degree leading to licensure as a professional land surveyor.

Based upon these findings, the decision was made to conduct a major revision of the AET curriculum. Proposed revisions include:

• Changing the focus of departmentally taught courses away from technology applications to the management of technical systems;

• Renaming the degree program to Agricultural and Environmental Systems Management (AESM);

• Developing concentration areas to help students’ select career directions and to enhance program marketability;

• Reducing the amount of math, chemistry and physics required;

• Requiring a course in leadership.

These changes will be implemented during the next academic year.
Degree Program: B.S. in Agricultural Business Management

Department: Agricultural and Resource Economics

Curriculum Code(s): ABM/BBM

Objectives of the Degree Program:
Students will be able to:
1. Recognize and demonstrate a sound understanding of basic concepts, principles, and terminology in economics and business.
2. Analyze and evaluate positions on economic/business issues.
3. Solve real-world economics/business problems effectively in the context of an industry or field of study.
4. Explain economics/business principles and concepts to lay audiences.
5. Graduate with a high degree of satisfaction in their education. Employers of graduates should likewise express satisfaction in their education and job skills.

Goals of the Degree Program:
The overall goal of the undergraduate program in the Department of Agricultural and Resource Economics is to offer its students a comprehensive theoretical and applied understanding of economic/business concepts. Students will be able to use the intellectual skills obtained to make reasoned choices concerning the resources which they control in personal, business, and professional decision making. Specific goals are listed below as the outcomes associated with each of the major objectives.

Outcomes of the Degree Program:
1a. Students can explain, through effective written and oral communication, economic/business concepts and principles in a way that demonstrates their comprehension of them.
2a. Students can dissect an economic/business issue into the various principles and concepts that form the basis for interpreting that issue.
2b. Students can critique an economic/business position on an issue in terms of the accuracy of its use of economics/business principles and concepts in making a claim about economics/business.
3a. Students can analyze appropriate economic data in terms of costs and benefits (returns).
3b. Students can present economic/business data and solutions to problems in a way that is clear and accurate.
4a. Students can translate economic/business concepts and principles into terms that can be understood by both general and specific audiences to help them understand economics/business more accurately.

4b. Students can take economics/business research and information and present it in a way that is comprehensible to lay audiences who need to act on that information.

5a. Students will, upon reflection of the education received from the ABM/BBM major, express a high degree of satisfaction and confidence in their economic/business knowledge.

5b. Employers will seek ABM/BBM graduates and express a high degree of satisfaction in their education, knowledge and job skills

Assessment Activity during the 2006-2007 Academic Year:
The department continued the ongoing assessment methods described as 1 (student work), 3 (exit interviews), 4 (course evaluations), 5 (peer review), 6 (employer) in the report for assessment during the 2005-2006 academic year. The results were examined for consistency to prior years, to see if any new information, trends, or deviations in student performance and satisfaction are developing that should be studied further for possible adjustment to courses and/or curriculum content. The results for 2006-2007 did not identify any particular areas of concern.

2. The results of a more recent alumni survey (2006) became available. These were studied to augment assessment item #2 in the 2005-2006 report. Several areas related to outcome objectives 1-4 were identified as important insights to our undergraduate teaching efforts.

In the graduating senior surveys administered each year, the area receiving high marks is their ability to communicate, both written and oral. This is an area that receives high priority in most classes taught by our faculty, an area emphasized by employers as well. In the alumni survey, of the 17 areas we identified as being of potential importance to their current professional position, the two areas receiving the highest level of importance by graduates were also the ability to communicate in writing and the ability to communicate verbally. These averaged 4.6 and 4.7 on a 5.0 scale (5= very important, 4= important, etc.). When asked how well prepared they were through their program at NCSU in each of the 17 areas, the ability to communicate in writing and the ability to communicate verbally also received the highest scores. Their ratings were 4.3 and 4.3 on a 5.0 scale, with only 3 of 39 respondents indicating less than a 4 (good). The alumni survey went to graduates of 2001, 2002, and 2003, so alumni would have been out in their jobs from 2.5 to 5.5 years. These results seem to validate the effort and success in the undergraduate program on written and oral communication.

In being able to solve real-world problems in economics and business (learning objective #3), seniors consistently rate this as the lowest among the objectives. However, in the alumni survey, working graduates rate this as one of their
strengths (4.4 on a 5.0 scale), next to their communication ability. Seniors apparently lack confidence in this ability but find that they have been better prepared and are able to perform in their jobs better than they had expected. The curriculum and courses of our ARE department should continue to emphasize application of course content to real world situations and problem solving. The senior survey and alumni survey also continue to confirm that students rate, as a strength of the department, the quality of advising and the interaction/accessibility of the faculty teaching undergraduate courses in our department.

3. An experimental “capstone” senior-level course in Advanced Agribusiness Management was initiated in 2005. In 2007, the course instructor (with input from other faculty) did a thorough evaluation of the results of student evaluations, quality of the course projects (the major component of the course), and insights of agribusiness employers who helped evaluate the projects and who also interviewed the students. This led to an update and revision of the course for 2007 to set the appropriate course content before moving the course to a permanent status. The results from the 2007 course are being evaluated, but the initial evaluation points to a much-improved course and quality of student work, with plans for further incorporating it into the ABM degree requirements.

4. The distance education component of the undergraduate program received continuing evaluation (see #7 from the 2005-2006 assessment report) during the year, with expansion of DE faculty and courses to be able to offer an ABM minor via distance courses. Course evaluations and demand from students shows a high level of satisfaction and high quality of courses being offered through distance learning. The ABM-DE minor will continue to be monitored for quality and ability of faculty to deliver the courses.
Degree Program: B.S. in Agricultural Education

Department: Agricultural and Extension Education

Curriculum Code(s): AED

Objectives of the Degree Program:
The objectives of the degree program are listed as the outcomes (below). Each objective/outcome of the program is associated with one of the major goals, as identified by the numbering system.

Goals of the Degree Program:
1. Demonstrate appropriate pedagogical skills in the classroom.
2. Develop well-rounded agricultural education programs in their schools.
3. Develop a broad base of agricultural knowledge to be communicated to learners.
4. Apply appropriate instructional technology for specific learning situations.
5. Apply critical thinking to solving educational and agricultural problems.
6. Demonstrate professional dispositions in education.

Outcomes of the Degree Program:
Outcomes are associated with the above Goals of the Program. Students who complete the degree program will be able to:

1.a. Select appropriate teaching techniques for specific situations.
1.b. Motivate students to learn
1.c. Adapt instruction to students with varying learning styles, academic abilities, and cultural backgrounds.
1.d. Evaluate learning and provide appropriate feedback to students.
1.e. Manage student behavior and solve discipline problems in the classroom.

2.a. Provide experiential learning opportunities for students.
2.b. Provide appropriate FFA activities consistent with agricultural education program objectives.
2.c. Provide agricultural education programs that meet the needs of the local community.

3.a. Ability to lead students in the solution of agricultural problems.
3.b. Communicate agricultural information to learners.

4.a. Use of a variety of instructional tools to communicate agricultural information.
4.b. Use of state-of-the-art instructional technology to aid instruction to students of various abilities.
4.c. Use of appropriate technology in the agricultural discipline.

5.a. Synthesize information from courses and educational experiences to arrive at appropriate solutions to problems.
5.b. Develop learning activities that develop problem solving skills in students.

6.a. Demonstrate fair and ethical treatment of students in educational settings.
6.b. Contribute to the overall welfare of the school.
6.c. Participate in professional development and professional improvement activities.

**Assessment Activity during the 2006-2007 Academic Year:**

The faculty in the department conducted the following assessment activities during the 2006-07 academic year.

1. Conducted an exit survey of all program completers (student teachers) to determine their perceived strengths and weaknesses upon completion of the program.

2. Collected exit evaluations of the student teachers' performance from the cooperating teachers in their student teaching centers and university supervisors based upon actual observations of student teachers' performance in the classroom. Multiple interim (formative) evaluations were also collected to determine progress of a student teacher during the student teaching experience.

3. Evaluated teaching portfolios for each student teacher to assess ability to plan learning activities and appropriate knowledge of the content area (agriculture).

4. Examined senior and alumni survey data in an effort to determine trends associated with program strengths and weaknesses.

5. Held faculty meeting to discuss findings from the above data. The results of the findings were that our students have met the objectives of planning and delivering instruction to students, but the program needs to be strengthened in the area of teaching diverse learners, especially students with learning disabilities. Agricultural knowledge and use of technology was found to be excellent. Student teachers were found to have excellent skills related to professional dispositions.

6. As a result of the assessment finding from this year, the department plans to develop a new course in teaching students from diverse backgrounds. A request was made to the Department of Curriculum Instruction to add an existing course in teaching special needs students to the AED curriculum, but the response was that they did not have the resources to accommodate additional students in the course.
Degree Program: B.S. in Agronomy

Department: Crop Science

Curriculum Code(s): TAA/TAC/TAT

Objectives of the Degree Program:
To provide a basic and applied science education that prepares our graduates for agronomic and turfgrass professional careers within North Carolina and around the world

Goals of the Degree Program:
1. To develop a basic understanding of how agronomic plants grow in various cropping systems and the ability to apply this knowledge to farm management
2. To develop the ability to recognize biotic and abiotic stresses and their symptoms in field situations and make appropriate management decisions
3. To develop the ability to communicate proficiently and professionally

Outcomes of the Degree Program:
1. Graduates will be able to describe how various agronomic crops grow and develop
2. Graduates will be able to describe how natural resources affect farming practices at a regional and global scale
3. Graduates will be able to develop economically sound crop management plans for various farm enterprises
4. Graduates will be able to develop environmentally sound crop management plans for various farm enterprises
5. Graduates will be able to identify weeds, diseases, and insects that have the potential to cause economic crop loss
6. Graduates will be able to identify plant symptoms of disease and insect infestations and of abiotic stresses for major agronomic crops
7. Graduates will be able to evaluate the potential economic impact of crop pest infestations and abiotic stresses for various cropping systems
8. Graduates will be able to make crop management recommendations that minimize economic losses from plant pest infestations and abiotic stresses
9. Graduates will be able to make pest management recommendations that do not adversely harm the environment
10. Graduates will be able to write reports and business correspondence in a manner acceptable in their professions
11. Graduates will be able to prepare and confidently present oral reports
12. Graduates will be able to interact confidently and effectively in various professional settings
Assessment Activity during the 2006-2007 Academic Year:
We had discussions with seniors and graduates from our programs during the academic year. Most agree that the senior seminar offers a good overview of professionalism and career preparation. However, all agree that the course content comes too late in their academic schedule and that students would be better prepared for internships and job interviews if this course were moved to the sophomore year. As a result, we will create a 1 hour Perspectives and Professional Development course for sophomores in the Agronomy curriculum.

Also, as a result of discussions with graduates and potential employers of our graduates, we are revising our Agronomy TAA, TAB, and TAC concentrations to allow more flexibility and to require an internship or research experience. We believe that these revisions are a vast improvement over the rigid structure of our current curriculum and will better prepare graduates to make significant contributions to the industry we serve. In addition, we are developing additional concentrations to address changing needs in the agricultural industries. The revisions and additions allow students to prepare for rapidly developing careers within our industry; areas such as applied plant biotechnology, biotechnology impact assessment, crop protection and food security, international agri-business enterprises, and precision agriculture.
Degree Program: B.S. in Agronomy

Department: Soil Science

Curriculum Code(s): TAB/TSS

Objectives of the Degree Program:
Provide an understanding of basic soil properties and integration with crop sciences to prepare graduates to solve agronomic problems.

Goals of the Degree Program: see objectives

Outcomes of the Degree Program:
1. Understand the basic physical, chemical and biological properties of soil
2. Apply the principles of soil and crop science in land management
3. Communicate proficiently and in a manner required of agronomic professionals

Assessment Activity during the 2006-2007 Academic Year:
Continuing assessment activities included review of course and instructor evaluations, peer review of selected courses by faculty review teams and completion of exit interviews of graduating seniors. Restructuring of SSC 361 was initiated with a new team taught approach. This was to take advantage of the expertise of a number of faculty specialties now required of our graduates. This was in part due to the feedback from our employing clientele. The teaching program was a subject of a Departmental retreat wherein all faculty were involved in the review. Discussion of employment opportunities and skill needs was undertaken along with survey results of alumni and employers of our graduates. As an outcome the planning for a new BS degree was initiated. Additional input is now being solicited via a survey of prospective employers as part of the degree planning process.
Degree Program: B.S. in Animal Science

Department: Animal Science

Curriculum Code(s): SAS/IAS

Objectives of the Degree Program:
Objective 1: Students should demonstrate the ability to understand and communicate information from the animal sciences in written form.

Objective 2. Students should demonstrate the ability to engage in scientific inquiry.

Objective 3. Students should demonstrate the ability to solve problems related to the animal sciences.

Objective 4. Graduating seniors should be satisfied with the education they received from the Department of Animal Science.

Goals of the Degree Program:
The goals of the Animal Science undergraduate degree program are to meet at least three of the four objectives each year (and on an ongoing basis).

Outcomes of the Degree Program:
Outcome 1: Students will be able to write clear, accurate responses to essay and short-answer questions in Animal Science courses.

Outcome 2: Students will be able to organize and summarize data/information in a way that is accurate and understandable.

Outcome 3. When presented with a problem relevant to the field of Animal Science, students will be able to determine what information is appropriate to solving the problem and then find it, assess its authority and validity, and use it effectively.

Outcome 4. Upon reflection on the education they received from their Animal Science Major, 80% or more of the responding students will be Very Satisfied or Moderately Satisfied with their overall education in Animal Science.

Course/Instructor Evaluations: The desired outcome is a score of 4.0 or higher (scale of 1 to 5, with 5 being best) for "overall course evaluation" and "overall instructor evaluation" for each course and instructor. The summary data (overall department, weighted by the number of students in each course) are presented with the College of Agriculture and Life Science data for "overall course evaluation" and "overall instructor evaluation." This summary sheet is shared with the department, but only the faculty member, Undergraduate Teaching Coordinator, and Department Head see the data for individual courses and
instructors.

Peer Evaluation of Teaching: The Department of Animal Science has ongoing peer-review of teaching to provide feedback to teaching faculty. Teams of 3 faculty members each attend 10% of lectures and labs for the course they are reviewing, and results are shared with the faculty member who teaches the course as well as the Department Head in Animal Science. The desired outcome is to have at least 80% of all faculties reviewed every 5 years.

Advising Evaluations: For advising, the desired outcome is that 80% or more of the responding advisees indicate their advisor is effective and the advisee would recommend his/her advisor to another student. Each advisor can log onto a secure website to access his/her advising evaluation data.

Assessment Activity during the 2006-2007 Academic Year:
Outcome 1 (writing skills) is assessed on a continuous basis by teaching faculty in the Department of Animal Science through evaluation of coursework materials such as exams, term papers, and lab reports. The teaching faculty is in agreement that most incoming freshmen do not have the skills necessary to synthesize thoughts and utilize critical thinking skills to solve problems and express themselves in writing (outcomes 2 and 3). The ANS 150 (Intro to Animal Science) instructors spend considerable time working with new students to develop these skills and prepare students for future Animal Science courses. Faculty who teach the upper level Management and Discipline courses evaluated students utilizing projects, case studies, papers, and exams; results were shared in departmental faculty discussions. In addition, the Undergraduate Education Committee met four times during the year to discuss curricula, courses, and the future direction of undergraduate education in the department, and suggestions were forwarded to the full faculty for discussions and decisions.

Outcome 4 is assessed via the Graduating Senior Survey. The May 2006 survey results were received during the Fall 2007 semester and 95.3% of Animal Science graduates said the quality of instruction in Animal Science is excellent (73.8%) or good (21.5%). When asked in retrospect if they would choose the same major, only 11.3% indicated they would not choose Animal Science.

The Graduating Senior Survey contains valuable information that also allows the department to assess student interest in each species represented by our classes, and it gives us important information on the profile and interests of our students. Additional information from the 2005/2006 Animal Science student Graduating Senior Survey states the following percentages were either very much or somewhat met for each of the following during the students' education: Applying scientific methods (92.2%), enhancing analytical skills (96.9%), and critical analysis of ideas/information (97.0%).

Course and Instructor Evaluations for Spring and Fall of 2006 (Spring 2007 is not yet available) provided the following assessment data: In Spring 2006, the Animal Science Department average score for "Overall Instructor" was 4.39 and for
"Overall Course" was 4.26. In Fall 2006, the Animal Science Department average score for "Overall Instructor" was 4.33 and for "Overall Course" was 4.19. Both semesters exceeded our objective of having the evaluations be above a 4.0 on a scale of 1 to 5. The course and instructor evaluations provide additional data that allow the department to assess each course and each instructor; this information is discussed between the department head and each faculty member during the faculty member's annual one-on-one meeting with the department head.

Four faculty members in Animal Science had their undergraduate courses peer-reviewed in the 2006/2007 academic years. They were: Melissa Ashwell (ANS 215, Basic Ag Genetics), Jeannette Moore (ANS 110, Intro to Equine Science), Mitch Hockett (ANS 304, Dairy Cattle Evaluation), and Bob Petters (ANS 495o, Lab Animal Management). Comments from these reviews are used to make improvement in courses, and the results of the peer-review process are discussed between the department head and each faculty member during the faculty member's annual one-on-one meeting with the department head.

The 2005/2006 Graduating Senior Survey included information on academic advising, and 90.8% of Animal Science students indicated academic advising was excellent or good. Advising evaluations for 2006/2007 were submitted electronically, and 126 Animal Science majors responded to the request from the College of Agriculture and Life Sciences to complete the online evaluation. Of the respondents, 89% said his/her advisor is effective and is recommended; 6% had no opinion. This exceeds our departmental objective of having 80% or more of the responding advisees indicate their advisor is effective and recommended. In addition to this information, the advising evaluation results provide the department and each advisor with information that allows assessment and improvement where necessary.

The departmental Undergraduate Education Committee met twice per semester to discuss Animal Science course and curricula assessment, undergraduate advising, and other student-related action items. Minutes of each meeting were approved electronically by the committee, and then were shared with the full Animal Science faculty prior to discussions of undergraduate matters at faculty meetings. As a result, a curriculum revision for both SAS (Science Animal Science) and IAS (Industry Animal Science) will be initiated in fall of 2007 with a requested effective date of January 2008. Changes will include replacing the 4-credit ZO 160 requirement with 8 credits of BIO 181 and BIO 183 as well as separating the lab from ANS 205, Anatomy and Physiology, so that ANS 205 lecture will be 3 credits and the lab will carry 1 credit. The Department of Agricultural & Resource Economics recommended that we add their two new courses as choices in our IAS concentration; the Undergraduate Education Committee discussed this and agreed unanimously to recommend that we do so. The two new courses are ARE 332 (Human Resource Management for Agribusiness) and ARE 215 (Small Business Accounting). It was hoped the proposed new General Education Requirements would be implemented prior to the curricula revisions, but there was no word on the new GER implementation by the end of the spring 2007 semester.
In addition, a faculty subcommittee met in September 2006 to discuss how to best approach our anticipated increasing student enrollment. (This was a follow-up meeting to the May 2006 subcommittee meeting; in September, the discussion focused on the four core undergraduate courses.) Options were discussed, and suggestions were forwarded to the Animal Science faculty for discussion and a vote.

Course and curricula actions in 2006/2007 relative to assessment of our Associate of Applied Science in Livestock and Poultry Management degree, which is jointly administered by the Animal Science and Poultry Science departments, included:

- Change ANS 061 (Swine Herd Management) from 3 credits to 4 credits (2 lectures, 2 labs) and change the name to Swine Production and Management;
- Drop ANS 065, Swine Herd Management;
- Change the LPM curriculum to reflect these changes.

The Swine Concentration for non-LPM students in the Ag Institute was also amended from requiring ANS 065 to requiring a pre-approved swine-related internship.
Degree Program: B.S. in Applied Sociology

Department: Sociology and Anthropology

Curriculum Code(s): ASA

Objectives of the Degree Program:
The objectives of the faculty in Sociology are to:
1. Provide instruction to enable students to understand human behavior within a social context.
2. Help students achieve competence in understanding, critically assessing, and using major sociological concepts.
3. Make students knowledgeable consumers and producers of research applicable to social problems or issues.
4. Introduce students to the varied theoretical perspectives of sociology.
5. Encourage in their students an appreciation and respect for cultural diversity in societies.

Goals of the Degree Program:
Our objectives provide the means to achieving the goals of the two colleges (CHASS and CALS) as they relate to social science knowledge, understanding and application. Keys to effective service and engagement include an ability to examine the roles and responsibilities of individuals, groups, and institutions in larger society while displaying an understanding of the complex relationships between human behavior and the social context, as well as the ability to analyze human behavior within a social context. Our students must be knowledgeable producers and consumers of social science information as citizens, no matter what career paths or educational directions they may take.

Outcomes of the Degree Program:
Students should be able to demonstrate:
1. An understanding of human behavior within a social context. Specifically, students should be able to demonstrate that they:
   a. can examine the roles and responsibilities of individuals, groups, and institutions in larger society, displaying understanding of the complex relationships between human behavior and the social context.
   b. can analyze human behavior within a social context from different perspectives.

2. Competence in understanding, critically assessing, and using major sociological concepts. Specifically students should be able to demonstrate that they:
   a. can define major sociological concepts involved in understanding social behavior, interaction and organization.
   b. can apply major sociological concepts to specific situations, showing that they are able to (1) use the concepts to organize and make sense of what they find in specific situations and (2) use specific situations to exemplify, amplify, and critique major sociological concepts.
3. That they are knowledgeable consumers and producers of research findings applicable to sociological problems or issues. Specifically, students should be able to demonstrate that they:
   a. can critique sociological research reported in popular or scholarly publications by describing the research problem, methodology, and results and making persuasive cases for the strengths and weaknesses of each.
   b. can propose a plan of research for a sociological problem or issue, including conceptualization of the problem, review of pertinent literature, design of a research study, and identification of methods appropriate for exploring the problem or issue.

4. Familiarity with various theoretical perspectives of sociology. Specifically, students should be able to demonstrate that they:
   a. articulate what are several key attributes of various theoretical perspectives of sociology.
   b. can describe and critically analyze the assumptions that underlie particular theoretical perspectives.
   c. can apply various theoretical perspectives to issues in society, showing how a perspective frames each issue, i.e., how we understand the issue, the kinds of questions we can ask about it, and the kinds of research methods we can apply to answering the questions.

5. An appreciation and respect for cultural diversity in societies. Specifically, students should be able to demonstrate that they:
   a. are aware of and comprehend the diversity of views within and across various social groups.
   b. understand social groups in various societies in terms of differences in sociocultural resources and outcomes

**Assessment Activity during the 2006-2007 Academic Year:**
Assessment Report for Applied Sociology and Applied Criminology
2006-2007
Department of Sociology and Anthropology
Patty McCall, Chair of Undergraduate Committee
Members: Maxine Atkinson, Risa Ellovich, Rod Engen, Bill Smith, Debbie Curran
(and Bill Clifford, CALS Representative)
Section 1–Evidence
The 2006-2007 Sociology and Criminology Assessment Report is based on our evaluation of a sample of seniors’ papers. These senior papers are used as a measure of our Outcome 3.a. as outlined in the original 2003 Program Assessment Report for Sociology and Criminology which states:

Students should be able to demonstrate:

3. That they are knowledgeable consumers and producers of research findings applicable to sociological problems or issues. Specifically, students should be able to demonstrate that they:
a. can critique sociological research reported in popular or scholarly publications by describing the research problem, methodology, and results and making persuasive cases for the strengths and weaknesses of each.

Section 1– Discoveries and Patterns
Summary of the senior paper evaluations: The overall assessment of our seniors’ papers is that they are improved over past years’ papers. This corresponds with anecdotal information that some of the judges expressed to the effect that the papers “seem to be getting better”. Even though the procedure for the judgment of these papers is comparable to recent years’ assessments, it is unclear whether we can attribute this to recent efforts to improve our undergraduate program. Based on a 2005-06 survey of faculty who teach 400-level classes, it seems fair to say that students do not appear to be well prepared for their upper-level writing assignments (based on the sample of papers that were assessed). Perhaps, since that survey was conducted, faculty who are assigning senior research papers are working more closely with students on these papers to improve the quality; or, perhaps, the caliber of students is improving. These issues and the details of the senior paper evaluations are provided below in Appendix B.

The senior paper assessment procedure, senior paper evaluation report, and evaluation rubric are provided in Appendices A, B, and C, respectively. This assessment process represents the most carefully scrutinized of our majors’ efforts.

In addition to the senior paper evaluations, there are two items on the graduating senior survey departmental insert that provide a further indication of our majors’ abilities with regard to senior papers. A review of the 2006 graduating senior survey shows a positive response to questions to our majors’ writing and research skills. Although these survey results are a more subjective tool for assessment purposes, these results provide another indicator of the department’s success in educating our students.

A review of the 2006 graduating senior survey supplements the senior paper evaluations and reveals a positive response from seniors to questions regarding our majors’ writing and research skills—approximately 90% answering in the affirmative to their undergraduate training. From the survey:
“Our department has several educational goals and expectations related to our sociology and anthropology majors. Some of these are listed below. Please indicate the extent to which you have attained each goal.”

Of the items related to research papers, the survey includes: “Gained expertise in writing papers” and “Research skills for gathering and evaluating evidence about social life/relationships”. The students could choose between the responses: “Great deal”, “Moderate amount”, “Fair amount”, “A little” and “Not at all”. Of the 60 respondents, 50% and 65 %, respectively, chose the highest-ranking response, “Great deal”, for these two items. An additional 38.3% and 28.3%, respectively, chose “Moderate amount” in response to these items. Therefore, approximately 90% of our graduating seniors indicate that they have greatly benefited from their coursework relative to developing writing and research skills.
Section 2 – Actions
The Undergraduate Committee’s related efforts toward improving our undergraduate program along with the evaluation of senior papers are developed in tandem in an iterative process. As we discover strengths and weaknesses in our program, we explore ways to rectify problems and take advantage of the department’s strengths to do so. Our committee has addressed past shortcomings by working more closely with SOC202 instructors to ensure our majors are receiving a solid foundation for subsequent coursework. Also, the undergraduate committee has begun preparing guidelines for courses at each 200-, 300-, and 400-level to provide faculty with tools to facilitate their students’ writing and research skills. These guidelines will comprise our committee’s major assessment efforts during the 2007-2008 academic year.

Our review remains on track in the spirit of the assessment goals. Our plans are to develop basic writing and research skills for our majors at the various course levels. Our senior paper evaluation is the primary tool for assessing our majors’ educational experience this year. Our other sources of information that will be reviewed in our Departmental Comprehensive Review are the UPA reports on the alumni survey and graduating senior survey.

Section 3 – Resources Required
At present, we require no resources to continue our assessment efforts. As we attempt to assess other program outcomes in the future, we may require resources. Although our efforts focus on one program outcome, these efforts tax our committee members’ time and energy. Nevertheless, even with this restricted assessment focus, we believe this process is contributing to an improved undergraduate program.

Appendix A
Assessment Procedures For Evaluation of Senior Term Papers

Term papers were randomly drawn from select 400-level Sociology courses in the Spring 2006. The courses include Soc404 Work and Family, Soc430 Community and Crime, and Soc450 Environmental Sociology. These courses were chosen as they seemed to have paper requirements of sufficient length (7 to 20 pages) that seem to meet a minimal definition of a term paper. (Some courses were excluded as the required papers were very short, such as multiple 1 page, or 5 page papers). Undergraduate committee members (McCall, Smith, Engen, Atkinson and Curran) in Spring 2007 read and ranked the papers on seven dimensions Thus, each paper had two rankers or “reviewers.” Graduating seniors were randomly drawn from the Spring graduation rolls. The rubric used to evaluate the papers is in Appendix C.

Appendix B
Senior Research Papers for 2006-07
Below results are summarized for the evaluations of 28 papers collected in the Spring semester of 2006 from graduating seniors (scheduled to graduate May 2006). Initially, the reliabilities are discussed and then the results presented in comparative format with results from 2002 through 2005. The papers in 2006 represent a random sample of papers in 400-level classes among students graduating in December 2006.

Recall that in the 2004 and 2005 analysis, the reliabilities were relatively low compared to conventional standards and compared to the first year’s reliabilities of the “judge pairs” who read each paper (each paper is read by two faculty “judges” who rate each paper on the 7 criteria). This year, a somewhat different procedure was followed in judging the papers. Initially outliers from the two evaluations were identified and subject to a third reviewer’s evaluation to correct of possible/likely errors in the evaluations. An initial outlier was defined as any paper with an evaluation where the difference in the evaluation is equal to or greater than two categories from the other judge’s evaluation. Approximately 17% of the specific evaluations could be classified as being outliers, involving 16 of the 55 papers reviewed (28 different papers were reviewed twice, with one missing). See Appendix C for further discussion of the handling of outliers.

Below results are presented in which the wayward evaluations are omitted, and that of a third judge is substituted (and attributed, for convenience, to the original judge). Table 1 shows the correlation and the reliabilities (Spearman-Brown reliability coefficients) for each of the five judges.

Table 1. Correlations and Spearman-Brown Reliability Coefficients for Five Judges for 2006 Graduating Seniors (based on approximately 12 evaluations per judge).

<table>
<thead>
<tr>
<th>Judge 1</th>
<th>Judge 2</th>
<th>Judge 3</th>
<th>Judge 4</th>
<th>Judge 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>corr</td>
<td>.754</td>
<td>.472</td>
<td>.539</td>
<td>.612</td>
</tr>
<tr>
<td>reliab</td>
<td>.860</td>
<td>.344</td>
<td>.700</td>
<td>.516</td>
</tr>
<tr>
<td>Topic</td>
<td>.286</td>
<td>.512</td>
<td>.250</td>
<td>.758</td>
</tr>
<tr>
<td>.445</td>
<td>.347</td>
<td>.577</td>
<td>.862</td>
<td></td>
</tr>
<tr>
<td>.485</td>
<td>.515</td>
<td>.732</td>
<td>.747</td>
<td></td>
</tr>
<tr>
<td>.653</td>
<td>.722</td>
<td>.746</td>
<td>.855</td>
<td></td>
</tr>
<tr>
<td>.739</td>
<td>.839</td>
<td>.854</td>
<td>.870</td>
<td></td>
</tr>
<tr>
<td>.850</td>
<td>.502</td>
<td>.426</td>
<td>.930</td>
<td></td>
</tr>
<tr>
<td>.639</td>
<td>.668</td>
<td>.597</td>
<td>.735</td>
<td></td>
</tr>
<tr>
<td>.780</td>
<td>.668</td>
<td>.558</td>
<td>.847</td>
<td></td>
</tr>
<tr>
<td>Organ.</td>
<td>.472</td>
<td>.344</td>
<td>.512</td>
<td>.788</td>
</tr>
<tr>
<td>.485</td>
<td>.347</td>
<td>.515</td>
<td>.502</td>
<td></td>
</tr>
<tr>
<td>.653</td>
<td>.722</td>
<td>.839</td>
<td>.668</td>
<td></td>
</tr>
<tr>
<td>.739</td>
<td>.839</td>
<td>.502</td>
<td>.668</td>
<td></td>
</tr>
<tr>
<td>.850</td>
<td>.668</td>
<td>.668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lit Rev.</td>
<td>.539</td>
<td>.700</td>
<td>.250</td>
<td>.516</td>
</tr>
<tr>
<td>.700</td>
<td>.577</td>
<td>.746</td>
<td>.862</td>
<td></td>
</tr>
<tr>
<td>.250</td>
<td>.746</td>
<td>.855</td>
<td>.870</td>
<td></td>
</tr>
<tr>
<td>.400</td>
<td>.746</td>
<td>.870</td>
<td>.930</td>
<td></td>
</tr>
<tr>
<td>.577</td>
<td>.855</td>
<td>.930</td>
<td>.735</td>
<td></td>
</tr>
<tr>
<td>.732</td>
<td>.870</td>
<td>.735</td>
<td>.847</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>.621</td>
<td>.491</td>
<td>.659</td>
<td>.758</td>
</tr>
<tr>
<td>.766</td>
<td>.414</td>
<td>.587</td>
<td>.862</td>
<td></td>
</tr>
<tr>
<td>.491</td>
<td>.587</td>
<td>.855</td>
<td>.870</td>
<td></td>
</tr>
<tr>
<td>.659</td>
<td>.587</td>
<td>.870</td>
<td>.930</td>
<td></td>
</tr>
<tr>
<td>.758</td>
<td>.862</td>
<td>.870</td>
<td>.735</td>
<td></td>
</tr>
<tr>
<td>Citations</td>
<td>.714</td>
<td>.833</td>
<td>.758</td>
<td>.615</td>
</tr>
<tr>
<td>.766</td>
<td>.862</td>
<td>.855</td>
<td>.762</td>
<td></td>
</tr>
<tr>
<td>.491</td>
<td>.758</td>
<td>.855</td>
<td>.788</td>
<td></td>
</tr>
<tr>
<td>.659</td>
<td>.862</td>
<td>.855</td>
<td>.881</td>
<td></td>
</tr>
<tr>
<td>.758</td>
<td>.862</td>
<td>.855</td>
<td>.695</td>
<td></td>
</tr>
<tr>
<td>.714</td>
<td>.833</td>
<td>.855</td>
<td>.820</td>
<td></td>
</tr>
<tr>
<td>Grammar</td>
<td>.612</td>
<td>.516</td>
<td>.681</td>
<td>.758</td>
</tr>
<tr>
<td>.759</td>
<td>.516</td>
<td>.693</td>
<td>.862</td>
<td></td>
</tr>
<tr>
<td>.516</td>
<td>.681</td>
<td>.741</td>
<td>.881</td>
<td></td>
</tr>
<tr>
<td>.681</td>
<td>.741</td>
<td>.851</td>
<td>.695</td>
<td></td>
</tr>
<tr>
<td>.612</td>
<td>.516</td>
<td>.693</td>
<td>.820</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>.625</td>
<td>.769</td>
<td>.615</td>
<td>.762</td>
</tr>
<tr>
<td>.769</td>
<td>.762</td>
<td>.881</td>
<td>.695</td>
<td></td>
</tr>
<tr>
<td>.615</td>
<td>.762</td>
<td>.881</td>
<td>.820</td>
<td></td>
</tr>
<tr>
<td>.762</td>
<td>.881</td>
<td>.820</td>
<td>.668</td>
<td></td>
</tr>
</tbody>
</table>

Note that these correlations and reliabilities are much higher than in 2005 (when 8 of the 35 correlations were actually negative! – 2005 results not shown here). In 2006 all of the correlations are positive, and none are below .250. Reliabilities of .8 or higher are generally considered “good” and 12 of the 35 reliabilities are above .8 in the table above. Twenty of the 35 are above .70, and 28 of the 35 are above .6 (which some researchers consider to be a “minimal” reliability level). Judge 2 has 3 reliability scores below .6, and Judges 3 and 5 have 2 reliability scores below .6. Judge 2 has the lowest reliability scores, and Judge 4 the highest. All of the reliabilities for the “overall” classification are above .668, indicating
moderately strong agreement as to the overall quality of each paper. No specific criterion stands out as having consistently low reliabilities across the 5 judges. In general, one could conclude that there is room for improvement in the consistency with which the papers are evaluated, but that the level of reliability is adequate for our purposes here.

Below we list the average scores for the four years of evaluation. Note that the evaluations for the years 2004 and 2005 are based on generally low reliabilities.

Table 2. Mean Ratings by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Topic</th>
<th>Organization</th>
<th>Literature Rev</th>
<th>Evidence</th>
<th>Citations</th>
<th>Grammar</th>
<th>Overall*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-3</td>
<td>3.50</td>
<td>3.35</td>
<td>3.51</td>
<td>3.47</td>
<td>3.13</td>
<td>3.51</td>
<td>3.41</td>
</tr>
<tr>
<td>2004</td>
<td>3.41</td>
<td>3.60</td>
<td>4.08</td>
<td>3.91</td>
<td>3.52</td>
<td>3.71</td>
<td>3.67</td>
</tr>
<tr>
<td>2005</td>
<td>3.48</td>
<td>3.18</td>
<td>3.10</td>
<td>3.05</td>
<td>3.35</td>
<td>3.43</td>
<td>3.09</td>
</tr>
<tr>
<td>2006</td>
<td>3.84</td>
<td>3.82</td>
<td>4.00</td>
<td>3.96</td>
<td>3.73</td>
<td>3.80</td>
<td>3.82</td>
</tr>
</tbody>
</table>

*For 2002-4 “overall” based on average of 6 criteria, whereas in 2005 & 2006 “overall” is based on the specific category “overall, the quality of the paper is…”

A comparison of the results for calendar year 2006 with the 2002-3 academic year indicates that there has been an overall improvement in the quality of the papers since 2002. This corresponds with anecdotal information that some of the judges expressed to the effect that the papers “seem to be getting better”.

Table 3 shows the percent of papers in 2002-3 versus 2006 that receive ratings of “good” or “very good.” As can be seen from the evaluations, the 2006 papers are much better than the 2002-3 papers, with the vast majority of papers being rated highly. The weakest criterion is that of “using citations properly” with only 71.4% of the senior research papers rated highly. The second worst criterion is “organization” (“paper is well organized, develops from original statement to conclusions logically; avoids lengthy tangents”). Caution should be used in interpreting these results, as the evaluations in the earlier years were generally made by different judges than those made in the later years. The early judges may have had “higher standards” in the application of the rubric than the current panel of judges. Also the results represent the rounding of an average of two numbers. Thus, a “good” rating can result from just one judge’s evaluation as “good” even if the other judge thinks it “intermediate”.

Table 3. Percent of Senior Research Papers Rated “Good” or “Very Good” by Year, (all scores x.5 or higher are rounded up, e.g., “3.5” becomes a “4”) 2002-3 2006

<table>
<thead>
<tr>
<th>Category</th>
<th>2002-3</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>57.1%</td>
<td>82.1%</td>
</tr>
<tr>
<td>Organization</td>
<td>60.0%</td>
<td>78.6%</td>
</tr>
<tr>
<td>Lit Review</td>
<td>71.5%</td>
<td>96.4%</td>
</tr>
<tr>
<td>Evidence</td>
<td>65.8%</td>
<td>96.4%</td>
</tr>
</tbody>
</table>
Whereas the evidence seems to point towards a substantial improvement in the quality of research papers over time, there are several alternative explanations. One is sample selection. Whereas only 9 of the 36 2002-3 course papers (25%) were from one class (SOC430), 21 of the 29 papers (72%) evaluated in 2006 were from that same course. An analysis of the SOC430 papers for 2002 reveals that they are generally rated highly -- comparable (only slightly lower generally) to the overall average of the papers evaluated in 2006. However, somewhat oddly, the SOC430 papers in 2006 are found on average to be below the overall average for papers in that year. SOC404 papers were included in 2006, but not in 2002-3, and they have very high ratings. So, if there are “selection effects” at work, they are of a complex nature that confounds our interpretation of the results. Since only a few courses are involved in the paper evaluation process (3 in 2006; 5 in 2002-3), the results could vary substantially if other classes had papers included in the evaluation. That is, the ratings could be influenced substantially by the sampling of other classes (if other classes had research papers).

Another complication to the interpretation of the data is lack of knowledge about the exact instructions teachers give the students on writing the papers. Perhaps the instructions have improved over the years so that students are learning how to write better research papers because of better instruction. It would be good to know that the teacher’s instructions have improved, as that would bolster our confidence in any claim that the students are learning how to write research papers better due to our instruction. Alternatively, it is possible that the students themselves are better students in the more recent years (e.g., have higher SAT’s and GPA’s). We don’t have much information “handy” on this. However, for 2002-3, the only statistically significant correlation between GPA and a paper evaluation criterion is with grammar ratings \( r=0.314 \). So, this would suggest that GPA, at least -- even if higher in 2006 than in earlier years -- may not be a factor in explaining the higher ratings of paper in 2006 than in 2002-3. (Yet, the N’s are low, so perhaps more observations are needed before dismissing GPA as a factor). Further details of the differences across years can be seen in Table 4 below, where descriptive statistics are presented for each of the years studied. Note that in 2006 there are fewer very low scores, and the standard deviations are somewhat smaller than in the earlier years.

Table 4. Descriptive Statistics for 2002-3 (AY), 2004(Spring), 2005(CY) and 2006 (CY)
A. Descriptive Statistics 2002-3*
<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avetop</strong></td>
<td>36</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5000</td>
<td>.94868</td>
</tr>
<tr>
<td><strong>Aveorgan</strong></td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.3472</td>
<td>.98430</td>
</tr>
<tr>
<td><strong>Avelitr</strong></td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.5139</td>
<td>1.01056</td>
</tr>
<tr>
<td><strong>Avevid</strong></td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.4722</td>
<td>.97793</td>
</tr>
<tr>
<td><strong>Avecita</strong></td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.1250</td>
<td>1.00267</td>
</tr>
<tr>
<td><strong>Avegram</strong></td>
<td>36</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5139</td>
<td>.81492</td>
</tr>
<tr>
<td><strong>Aveoverall</strong></td>
<td>36</td>
<td>1.92</td>
<td>4.92</td>
<td>3.4120</td>
<td>.80597</td>
</tr>
<tr>
<td><strong>Valid N</strong></td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*overall average calculated as average of other six criteria.

### B. Descriptive Statistics, Spring 2004

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avetop</strong></td>
<td>21</td>
<td>2.00</td>
<td>5.00</td>
<td>3.4048</td>
<td>.93031</td>
</tr>
<tr>
<td><strong>Aveorgan</strong></td>
<td>21</td>
<td>2.50</td>
<td>5.00</td>
<td>3.5952</td>
<td>.66368</td>
</tr>
<tr>
<td><strong>Avelitr</strong></td>
<td>20</td>
<td>3.00</td>
<td>5.00</td>
<td>4.0750</td>
<td>.63401</td>
</tr>
<tr>
<td><strong>Avevid</strong></td>
<td>21</td>
<td>3.00</td>
<td>5.00</td>
<td>3.9048</td>
<td>.60455</td>
</tr>
<tr>
<td><strong>Avecita</strong></td>
<td>21</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5238</td>
<td>.91482</td>
</tr>
<tr>
<td><strong>Avegram</strong></td>
<td>21</td>
<td>2.50</td>
<td>5.00</td>
<td>3.7143</td>
<td>.73436</td>
</tr>
<tr>
<td><strong>Aveoverall</strong></td>
<td>21</td>
<td>2.83</td>
<td>4.75</td>
<td>3.6706</td>
<td>.53908</td>
</tr>
<tr>
<td><strong>Valid N</strong></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*overall average calculated as average of other six criteria.

### C. Descriptive Statistics, 2005 (CY)*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avetop</strong></td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.4828</td>
<td>.81813</td>
</tr>
<tr>
<td><strong>Aveorgan</strong></td>
<td>28</td>
<td>3.00</td>
<td>5.00</td>
<td>3.1786</td>
<td>.69674</td>
</tr>
<tr>
<td><strong>Avelitr</strong></td>
<td>29</td>
<td>1.50</td>
<td>5.00</td>
<td>3.1034</td>
<td>.84915</td>
</tr>
<tr>
<td><strong>Avevid</strong></td>
<td>29</td>
<td>1.50</td>
<td>5.00</td>
<td>3.0517</td>
<td>.77165</td>
</tr>
<tr>
<td><strong>Avecita</strong></td>
<td>29</td>
<td>1.00</td>
<td>4.50</td>
<td>3.3448</td>
<td>.83563</td>
</tr>
<tr>
<td><strong>Avegram</strong></td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.4310</td>
<td>.74071</td>
</tr>
<tr>
<td><strong>Aveoverall</strong></td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.0862</td>
<td>.66907</td>
</tr>
<tr>
<td><strong>Valid N</strong></td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### D. Descriptive Statistics, 2006

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avetop</strong></td>
<td>28</td>
<td>2.50</td>
<td>5.00</td>
<td>3.8393</td>
<td>.70781</td>
</tr>
<tr>
<td><strong>Aveorgan</strong></td>
<td>28</td>
<td>3.00</td>
<td>5.00</td>
<td>3.8214</td>
<td>.62678</td>
</tr>
<tr>
<td><strong>Avelitr</strong></td>
<td>28</td>
<td>2.50</td>
<td>5.00</td>
<td>4.0000</td>
<td>.50918</td>
</tr>
</tbody>
</table>
As for thoughts on future evaluations, I would like to suggest that we consider adding some criteria to our current list of seven. Since all of the current 7 seem somewhat subjective to me, it might be useful to add a couple of more “objective” criteria. One might have to do with basic sentence structure. Several of the papers seemed to have problems with sentence structure, yet there is no place to evaluate that dimension in the current rubric. Another dimension is the use of transitions (either paragraph to paragraph or from section to section). Other dimensions may be added as well, as the undergraduate committee sees fit.

Appendix C

Sociology Department Paper Assessment Rubric Sheet Paper Number _____
Grader One _____________ Grader Two _______________
Paper Written In: (circle one) ___ Spring 06 ___ Fall 06
Paper was Written For Course SOC______

Assessment Criteria (Rubric) for Sociology Research Papers from 400-Level Courses
(Modified January 31, 2006)
INSTRUCTIONS: Students should be able to clearly state their research question, purpose of the research or hypothesis and collect information necessary to address the research question or hypothesis using library sources, electronic data sources, and/or social science methodologies. ONE: After grading each paper by checking the boxes below, separate your rubric sheets from the pack of papers, place the rubric sheets in an envelope and return them to Bill Smith (mail room, or room 327). TWO: pass on the papers and the blank rubric sheets to the second reviewer listed on the rubric sheet. (Obviously, each Grader should not see the other Grader’s completed rubric sheet.) THREE: Please return all papers after the 2nd reader has graded the paper and all completed rubric sheets to Bill Smith by March 1st, noon.

Please read the assigned paper(s) and rate each paper on each of the seven criteria below.
Criteria (see over for elaboration) 1 Very Poor 2 Poor 3 Intermediate 4 Good 5 Very Good

I. The research question, purpose of research, topic, or hypothesis(es) is clearly stated, giving a clear idea of what the topic is, and why it should be studied.
II. The paper is well organized, develops from original statement to conclusions logically; avoids lengthy tangents
III. There is a representative scholarly literature review that is relevant to the research question, topic or hypothesis(es).
IV. There is appropriate evidence discussed and marshaled relevant to the research question, topic, or hypothesis(es).

V. The student uses citations properly (attribution of quotations, paraphrases) and in a consistent fashion; no plagiarism.

VI. Paper is consistent with existing standards of written English grammar, syntax, punctuation, and spelling.

VII. Overall, the quality of the paper is:

The reviewers should assess the papers as consistently as possible across the various course assignments. Some clarification of the Seven-point rubric is provided below.

I. The student does not need to summarize the findings (like an abstract) in the introduction, but should provide a clear indication of the paper’s focus. Some may provide an actual topic statement or research question, but the topic may be presented with a paragraph description of the paper’s purpose.

II. This category assesses more the structure than the substance of the paper. Simply put, the paper should proceed with an introduction (statement of the problem), a body focused on the topic at hand, and a conclusion that is derived from the literature review.

III. It is important that scholarly sources provide the evidence for the paper and that the literature selected is representative of the arguments found in the area of study.

IV. A coherent argument should be developed from the literature reviewed for the topic.

V. Credit is given for others’ work; citations provided; quotations used as needed; no hints of plagiarism. The source of the ideas presented should be clear to the reader.

VI. Strict adherence to classic punctuation requirements may be relaxed (with contemporary de-emphasis on use of commas, for example).

VII. This category provides the reviewer with a chance to grade the quality of the student’s work. (The student may be able to satisfy many of the above category requirements without quality.) This is your chance to rate the overall quality.
**Degree Program:** B.S. in Biochemistry

**Department:** Biochemistry

**Curriculum Code(s):** BCH

**Objectives of the Degree Program:**

Objective 1: A student in biochemistry is expected to have a foundation in the supporting fields of chemistry, life sciences, physics and mathematics

Objective 2: A student in biochemistry is expected to have an understanding of the language and concepts of Biochemistry

Objective 3: A student in biochemistry is expected to read, understand and express themselves confidently and competently in written and oral communications within the field of Biochemistry.

Objective 4: A student in biochemistry is expected to work effectively and competently in the laboratory.

**Goals of the Degree Program:**
The goal is to meet the objectives and measure the outcomes.

**Outcomes of the Degree Program:**

Outcome 1: Our students will successfully complete a variety of courses in chemistry, mathematics, physics, microbiology, biological sciences, genetics, botany and zoology.

Outcome 2a: A student in Biochemistry will be able to describe the structure and function of biomolecules: proteins, nucleic acids, lipids and carbohydrates.

Outcome 2b: A student in Biochemistry will be able to describe the concepts of metabolic processes - such as the synthesis and breakdown of biomolecules [amino acids, proteins, carbohydrates, lipids, nucleotides and nucleic acids], oxidative phosphorylation, photosynthesis, replication, transcription, and translation.

Outcome 2c: A student in Biochemistry will be able to describe the regulation of metabolic processes such as gene expression, enzyme activity and signal transduction.

Outcome 3a: A student in Biochemistry will be able to demonstrate through discourse with their peers an understanding of the words and concepts of Biochemistry.

Outcome 3b: A student in Biochemistry will be able to write effectively in the genre, including laboratory reports, written themes and research reports.
Outcome 3c: A student in Biochemistry will be able to read and summarize journal articles found in various Biochemical journals.

Outcome 4a: A student in Biochemistry will be able to demonstrate the mastery of basic laboratory skills, assays and techniques.

Outcome 4b: A student in Biochemistry will be able to collect data, analyze data, pose hypotheses and draw conclusions.

Outcome 4c: A student in Biochemistry will be able to work effectively either singly or in a group.

Assessment Activity during the 2006-2007 Academic Year:

BCH 451, Principles of Biochemistry, serves as both the first and introductory course in Biochemistry to Biochemistry majors and as well as a service course to several other majors. Specifically, BCH 451 is required for a BS in Biological Sciences, for a BA in Chemistry, BS in Chemical Engineering - Bioscience Option, and a minor in Genetics. It will soon be required for a BS in Chemistry. Biochemistry is unusual because it utilizes the information from Chemistry, Biology, Zoology, and to some extent Physics. Because, this course serves such a pivotal role in a variety of curricula, Emily Gifford decided to examine this role as her CALS honors project. Her specific goal was to survey all students currently enrolled in BCH 451 and students graduating in Biochemistry. The survey instrument was designed to address the following questions: How helpful were various background courses for BCH 451? What BCH 451 topics were repeated in other courses? How necessary was this repetition? A preliminary survey was developed and administered during the fall 2006 semester. The student feedback was used to improve the survey that was subsequently administered to all students enrolled in BCH 451 during the spring of 2007 (~300 students) and to all May 2007 graduates in Biochemistry (~60 students). The response rate was 70 - 80% and was probably influenced by the instructors’ awarding of extra credit for completion of the surveys. No inducements were made for the graduates. A presentation of the results was given at the NCSU Undergraduate Research and Teaching Symposium.

As expected, the most helpful course prior to BCH 451 is the organic chemistry series. The surprise was that the second most helpful course is Genetics 411. The Biological Sciences sequence of BIO 181 and 183, Microbiology 351, and Zoology 421 were tied at third. Chemistry 101 and 201 were next with Zoology 160 and Zoology 250 being the least helpful of the courses surveyed.

Forty different and arbitrarily selected topics from BCH 451 were surveyed according to the extent of repetition. Of these forty, only 10 were considered to be non-repetitious by the students. That is, less than 20% of the students thought that they were repeated. When asked for unnecessary repetition, three topics were identified: cell biology/organelles, cell membranes, and central dogma. Not surprisingly, these three topics had the repetition in Biology 181/183, Microbiology 351, and to some extent in Genetics 411. However, it should be
noted that quizzes given at the beginning of BCH 451 demonstrate that most students do not understand and many times cannot even present the central dogma.

In the comment section of these surveys, some students stated that they wished that they had taken the time to understand certain concepts more fully before coming into BCH 451. They also wished that their professors had emphasized them more.

The student impressions as determined by this survey support the course instructors’ expectation on the relative importance of Organic Chemistry and Biological Sciences as these are defined course prerequisites. The other courses mentioned as helpful provides important advising assistance to maximize student success in BCH 451. The extent of overlap of the survey course topics, even though significant, does not seem to be an issue for the students, with the exception of the three topics identified above. In fact, the repetition is probably appropriate for most of the students in BCH 451.
Degree Program:  B.S. in Biological Engineering

Department:  Biological and Agricultural Engineering

Curriculum Code(s):  BE/BEA/BEE/BEP

Objectives of the Degree Program:
The Biological and Agricultural Engineering Department offers an undergraduate BS degree program in Biological Engineering (BE). Emphasis is placed upon mastering the fundamentals of engineering and biology, developing the ability to solve engineering problems, improving self-confidence, and applying the creative process of engineering design. The BE program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone: (410) 357-7700. The BAE faculty, in concert with program constituencies, have developed the following undergraduate program educational objectives for the BE degree.

Graduates of this program, within the first few years following graduation, will be:

1. Prepared to establish successful careers in engineering, as related to one of the specialized program focus areas: Agricultural, Bioprocessing and Environmental.
2. Able to grasp and apply engineering principles, procedures, and time management skills needed to solve complex, real-world problems especially as related to the fields of man-machine systems, greenhouse and animal structures, agricultural water and waste management, and unit operations in food and biological systems.
3. Professionally responsible in their work ethic while performing engineering tasks at a high level of expertise and willing to accept the ethical responsibility for the social and environmental impacts of engineering practices.
4. Able to communicate effectively with diverse audiences and able to work effectively in today's integrated team environments.
5. Broadly educated engineers and life-long learners, with a solid background in the biological sciences, engineering sciences and mathematics; an understanding and appreciation for the arts, humanities, and social sciences; and, a desire to seek out further educational opportunities.
6. Knowledgeable of current advances in engineering practice and research; prepared for opportunities in graduate engineering education and making progress towards registration as a professional engineer.
7. Capable of contributing to the future economic and social well-being of citizens of North Carolina, the nation and the world.

Goals of the Degree Program:  To meet each of the program educational objectives.

Outcomes of the Degree Program:
(a) To demonstrate that graduates have an ability to apply knowledge of mathematics, science, and engineering, they should:
* show that they can employ general principles, theories, concepts, and/or formulas from mathematics, science, and engineering in the solution of particular engineering problems. For a particular problem, graduates should demonstrate that they can:
1. define and describe the pertinent principles and appropriate assumptions, theories, concepts, and/or formulas;
2. explain how they are appropriate to the problem; and
3. demonstrate how they have been applied in the solution of the problem.
* respond positively, after they have been on the job, to the instruction and guidance they received at NC State in applying knowledge of mathematics, science, and engineering to the particular engineering problems they encounter at work;
* achieve a positive rating from their employers regarding their ability to apply general principles of mathematics, science, and engineering to particular engineering situations.

(b) To demonstrate that graduates have an ability to design and conduct experiments as well as analyze and interpret data, they should:

* show that they can take an experimental problem and develop a hypothesis, define the pertinent dependent and independent variables, and establish a sound experimental method that will allow them to measure the variables and test the hypothesis;
* show that they can conduct an experimental procedure, use laboratory materials properly and safely, carefully note observations in a laboratory notebook, and describe the procedure clearly for others;
* show that they can measure and record raw experimental data and analyze those data for the purposes of understanding and explaining the data. Graduates should be able to represent data in both verbal and visual forms (equations, tables, graphs, figures, etc.) in a way that is both an accurate and an honest reflection of the data.
* show that they can render the data meaningful by discussing the data in the context of the hypothesis and appropriate theories and principles and by stating, clearly and concisely, conclusions that can be drawn from the experiment.

(c) To demonstrate that graduates have an ability to design a system, component, or process to meet desired needs, they should:

* show that they can apply engineering and biological principles and concepts optimally and creatively in the process of design. Design is a multi-task process that requires a balance of opposing characteristics: divergent and convergent thinking, synthesis and analysis, aesthetic and utilitarian sensibilities, all geared toward achieving an optimal solution. The process itself is flexible and recursive; that is, designers often find it necessary to move seamlessly among the different phases of the process as dictated by the design process needs. It is helpful to think of the design process as defined by the following phases:
1. defining the project. Project goals (objectives) are clearly and concisely developed in verbal and written communication with the project sponsor,
customers and engineering consultants. Another important aspect of project
definition is gathering information in on-site observations. Key engineering and
biological principles are identified as well as project deliverables; developing the
criteria (specifications) from the goals and the engineering parameters of the
project;
2. identifying relevant resources in the professional literature--such as scientific
articles, U. S. patents, and standards--to find information and concepts that have a
substantive impact on the design;
3. forming a design team consisting of student(s), sponsors, engineering
consultant(s) and others and managing time resources to meet critical project
deadlines.
4. brainstorming for alternative possibilities. These may be possibilities for
achieving the goals of the project or possibilities for finding solutions to
immediate problems that come up during the process;
5. identifying the best of the possible solutions. This part of the process involves
optimization of the solution with respect to the criteria. Analytic and/or empirical
evaluation of the alternatives is conducted to determine important optimal
features;
6. creating a physical prototype or model that embodies or represents the chosen
features;
7. testing the prototype or model against the criteria for the project. The results of
this experimental evaluation may send the designers back to any of the above
stages;
8. choosing and justifying to an appropriate audience, in both written and verbal
formats, the final system, component, or process designed. Presentation of final
design results must be done with reference to the criteria developed for the
project.
* respond positively, after they have been on the job, to the training and guidance
in design process they received at NC State;
* achieve a positive rating from their employers regarding their ability to engage
productively and creatively in the process of design.

(d) To demonstrate that graduates have an ability to function on multi-disciplinary
teams, they must:

* possess a conceptual understanding of group dynamics, that is, how to make
groups work effectively. This conceptual understanding includes:
  1. how to create a group climate that encourages success,
  2. how to recognize and make effective use of power resources in group activities,
and
  3. how to use communication and negotiation strategies for dealing productively
with conflict.
* show that they can participate effectively as team members in group projects:
  working cooperatively with others, accepting diverse views, encouraging active
participation of others, dealing productively with conflict, and taking leadership
roles as the need arises to accomplish the group's objective;
* show that they can work successfully with people who are in other fields and
those who perform a variety of functions within a group as well as demonstrate
flexibility in the roles and functions they play. This means that they must:
1. exhibit respect for these people and the diversity they bring to the group,
2. accept and incorporate, where appropriate, ideas from people with different perspectives; and
3. explain pertinent engineering principles and applications to people who have no training in those principles and applications but who need to make use of them.

* report, upon graduation, positive experiences related to the work they have done in teams. And if those experiences have been negative they should show that they know what they could have done to make their teams work more productively;
* respond positively, after they have been on the job, to the training and guidance they received at NC State in working in teams;
* achieve a positive rating from their employers regarding their ability to work effectively in multi-disciplinary teams.

(e) To demonstrate that graduates have an ability to identify, formulate, and solve engineering problems, they should:

* show that they can identify engineering problems. Problem identification entails two procedures:
  1. the ability to recognize an engineering problem. An engineering problem is an opportunity for change in which engineering solutions can be applied to improve existing or anticipated conditions; and
  2. the ability to define an engineering problem. Defining a problem means describing, in concrete and specific terms, the existing or anticipated condition that creates the opportunity for change and the goal state(s) that provides the direction and end-point for change.
* show that they can analyze problems, that is, isolate and describe the important components of a problem: what is given (design specifications, availability of materials, performance requirements, testing standards, etc.); what is known from previous experience relevant to the problem; and what the unknowns are;
* show that they can represent a problem in a form that makes finding solutions more efficient and effective. Such representations are typically visual, such as a model, flow chart, diagram, or table. This visualization should represent the components of the problem in a way that leads to the construction of a solution.
* show that they can apply engineering principles and mathematics to find the unknowns and arrive at appropriate solutions to the problem;
* respond positively, after they have been on the job, to the training and guidance they received at NC State in solving engineering problems;
* achieve a positive rating from their employers regarding their ability to solve engineering problems.

(f) To demonstrate that graduates have an understanding of professional and ethical responsibility, they should:

* show that they can apply an understanding of ethical responsibility to a design project. This means demonstrating that they can
  1. identify the ethical issues pertinent to a project,
  2. generate ethical criteria related to the project,
3. incorporate those criteria in the justification of the final outcome of the project, and
4. argue effectively for the responsibility of the project engineer in maintaining the optimal balance between the contending forces of utility, cost, and risks.

* respond positively, after they have been on the job, to the preparation in professional and ethical responsibility they received at NC State;
* achieve a positive rating from their employers regarding their professional and ethical responsibility.

(g) To show that graduates have an ability to communicate effectively, they should:

* exhibit a mastery of the forms of discourse appropriate to the profession of engineering: laboratory report, oral and written progress report, technical report, technical presentation, etc. Depending on the form that is used, students should demonstrate that they can:
  1. describe the context (institutional and/or technological) of a problem and the significance of that problem within that context (introduction);
  2. describe clearly and precisely the procedures used to solve the problem (methods);
  3. report both verbally and visually the findings (results);
  4. interpret the findings in a way that is appropriate to the audience (discussion); and
  5. propose recommendations for a solution to the problem and justify that solution persuasively (conclusion).

* show that they can summarize technical material in a way that is appropriate to a particular audience. Graduates should demonstrate that they can synthesize their own work and the work of others in the form of abstracts, executive summaries, and literature surveys.

* show that they can communicate successfully for obtaining and maintaining productive employment. For obtaining employment, graduates should show that they can write résumés and letters of application and perform capably in a job interview situation. For maintaining employment, graduates should show that they can write competent memos, letters, e-mail messages, proposals, and various reports (progress, personnel, maintenance, sales, trip, etc.) and give effective oral presentations to a variety of audiences.

* express confidence, upon graduation, of their ability to communicate effectively in their engineering careers and satisfaction with the guidance and instruction they received in writing and speaking;

* respond positively, after they have been on the job, to the usefulness and appropriateness of the preparation they received at NC State in oral and written communication;

* achieve a positive rating from their employers regarding their ability to communicate effectively.

(h) To demonstrate that graduates have the broad education to understand the impact of engineering solutions in a global and societal context, they should:
* express satisfaction, upon graduation, that their education at NC State has helped them to understand the impact of engineering solutions in a global and societal context;
* respond positively, after they have been on the job, to the broad education they received at NC State and the way it has helped them to understand the impact of engineering solutions in a global and societal context.

(i) To demonstrate that graduates recognize the need for and possess the ability to engage in life-long learning, they should:

* show that they can use the critical information-seeking tools that enable engineers to continue to stay up to date in their profession: internet resources, engineering journals, U.S. and foreign patent materials, standards, etc.
* show that as long as they continue to be employed as engineers, they are actively involved in the profession: membership in an engineering society, achievement and maintenance of technical registration for engineers, involvement in continuing education, etc.
* express, upon graduation, both a full appreciation for the need for and the motivation to pursue further education and training, both engineering and otherwise, over their lifetimes;
* show that after graduation they have continued to seek opportunities for further education and training, both engineering and otherwise.

(j) To demonstrate that graduates possess a knowledge of contemporary issues, they should:

* show that they have taken and performed adequately in a variety of university courses that are concerned with contemporary issues and/or the context for understanding those issues, including courses in the humanities, arts, and social sciences, and those that combine one or more fields of study, such as science, technology, and society;
* respond positively, after they have been on the job, to the quality of education in contemporary issues they received at NC State.

(k) To demonstrate that graduates have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice, they should:

* show that they possess skills in time management and interpersonal communication and techniques for gathering information critical to effective engineering practice: World Wide Web, library, patent literature, etc.
* show that they can use modern engineering tools, such as CAD, engineering graphics literacy, presentation skills and graphical displays, and computer literacy.

**Assessment Activity during the 2006-2007 Academic Year:**
The BAE Department underwent a comprehensive CSREES review in May 2007 during which assessment results were reviewed. Receipt of the final report is pending. Prior to this review, the BE degree were discussed at length during a
program retreat conducted in June 2006. The BAE Courses and Curricula committee subsequently undertook an examination of the program with regards to direction, course interaction, and concentration areas. Implementation of program revisions was delayed until the final review report is received.
Degree Program: B.S. in Biological Sciences

Department: Biological Sciences

Curriculum Code(s): BLS

Objectives of the Degree Program:
Students will be able to:
1. Demonstrate an understanding of biological systems and processes at all levels of organization.
2. Apply critical thinking skills to solving problems in biology and related fields.
3. Communicate scientific information effectively.

Goals of the Degree Program:
The goals of the Biological Sciences Program are to prepare graduates who are proficient in biological sciences as well as communication and to foster in students an understanding and appreciation of the complexity of the world in which we live. Biologists study many different facets of life from the molecules that make up individual cells to the behavior and ecology of animals and plants. The Biological Sciences Program at NC State University educates students who desire to enter this interesting, challenging, and rewarding field.

A Research/Work Experience is required of each student in the Biological Sciences Program. This requirement may be met in one of several ways, including completion of a project while enrolled in either BIO 492 (External Learning Experience), BIO 493 (Special Problems in Biological Sciences), or BIO 495 (Special Topics in Biology). Students develop a plan of work/contract in consultation with their adviser and research mentor for approval by the Biological Sciences Program. Upon completion of the research/work experience, the students prepare and submit a project report that is reviewed by faculty for evidence of comprehension and appreciation of biological concepts, the ability to apply knowledge and skills gained in coursework to problem-solving in biology and related fields, and facility in communication.

Outcomes of the Degree Program:
Upon completion of the Bachelor of Science (B.S.) degree in Biological Sciences, students will be able to:
1. Demonstrate the ability to: a) utilize critical thinking skills in problem-solving and b) apply their knowledge and understanding of biological systems to the effective solution of biologically-related problems.
2. Communicate biological science-related information effectively to experts as well as non-experts.
3. Succeed in securing employment or admission to graduate and professional schools.
Assessment Activity during the 2006-2007 Academic Year:
The assessment activities of the 2005-2006 Academic Year were continued with a major emphasis on revisions to BIO 181 and BIO 183 (Introductory Biology I and II, respectively). The major initiative undertaken during this past year as a result of the above assessment was to plan for a complete overhaul of BIO 181 and BIO 183. Faculty groups met over the course of several months to develop a plan for these revisions and submitted major revision course action forms for both courses. The University Course and Curriculum Committee approved those course actions in May 2007. Work on these changes will continue this summer and coming academic year and will be implemented beginning Fall 2007 for BIO 181 and Spring 2008 for BIO 183.
Degree Program: B.S. in Criminology
Department: Sociology and Anthropology
Curriculum Code(s): ACR

Objectives of the Degree Program:

PROGRAM OBJECTIVES

The objectives of the faculty in Sociology are to:
1. provide instruction to enable students to understand human behavior within a social context.
2. help students achieve competence in understanding, critically assessing, and using major sociological concepts.
3. make students knowledgeable consumers and producers of research applicable to social problems or issues.
4. introduce students to the varied theoretical perspectives of sociology.
5. encourage in their students an appreciation and respect for cultural diversity in societies.

Goals of the Degree Program:

Our objectives provide the means to achieving the goals of the two colleges (CAL and CHASS) as they relate to social science knowledge, understanding and application. Keys to effective service and engagement include an ability to examine the roles and responsibilities of individuals, groups, and institutions in larger society while displaying an understanding of the complex relationships between human behavior and the social context, as well as the ability to analyze human behavior within a social context. Our students must be knowledgeable producers and consumers of social science information as citizens, no matter what career paths or educational directions they may take.

Outcomes of the Degree Program:

Students should be able to demonstrate:
1. An understanding of human behavior within a social context. Specifically, students should be able to demonstrate that they:
a. can examine the roles and responsibilities of individuals, groups, and institutions in larger society, displaying understanding of the complex relationships between human behavior and the social context.
b. can analyze human behavior within a social context from different perspectives.

2. Competence in understanding, critically assessing, and using major sociological concepts. Specifically students should be able to demonstrate that they:
a. can define major sociological concepts involved in understanding social behavior, interaction and organization.
b. can apply major sociological concepts to specific situations, showing that they
are able to (1) use the concepts to organize and make sense of what they find in specific situations and (2) use specific situations to exemplify, amplify, and critique major sociological concepts.

3. That they are knowledgeable consumers and producers of research findings applicable to sociological problems or issues. Specifically, students should be able to demonstrate that they:
   a. can critique sociological research reported in popular or scholarly publications by describing the research problem, methodology, and results and making persuasive cases for the strengths and weaknesses of each.
   b. can propose a plan of research for a sociological problem or issue, including conceptualization of the problem, review of pertinent literature, design of a research study, and identification of methods appropriate for exploring the problem or issue.

4. Familiarity with various theoretical perspectives of sociology. Specifically, students should be able to demonstrate that they:
   a. articulate what are several key attributes of various theoretical perspectives of sociology.
   b. can describe and critically analyze the assumptions that underlie particular theoretical perspectives.
   c. can apply various theoretical perspectives to issues in society, showing how a perspective frames each issue, i.e., how we understand the issue, the kinds of questions we can ask about it, and the kinds of research methods we can apply to answering the questions.

5. An appreciation and respect for cultural diversity in societies. Specifically, students should be able to demonstrate that they:
   a. are aware of and comprehend the diversity of views within and across various social groups.
   b. understand social groups in various societies in terms of differences in sociocultural resources and outcomes

**Assessment Activity during the 2006-2007 Academic Year:**
Department of Sociology and Anthropology
Patty McCall, Chair of Undergraduate Committee
Members: Maxine Atkinson, Risa Ellovich, Rod Engen, Bill Smith, Debbie Curran
(and Bill Clifford, CALS Representative)

Section 1–Evidence
The 2006-2007 Sociology and Criminology Assessment Report is based on our evaluation of a sample of seniors’ papers. These senior papers are used as a measure of our Outcome 3.a. as outlined in the original 2003 Program Assessment Report for Sociology and Criminology which states:
Students should be able to demonstrate:

3. That they are knowledgeable consumers and producers of research findings applicable to sociological problems or issues. Specifically, students should be able to demonstrate that they:
   a. can critique sociological research reported in popular or scholarly publications by describing the research problem, methodology, and results and making persuasive cases for the strengths and weaknesses of each.

Section 1– Discoveries and Patterns
Summary of the senior paper evaluations: The overall assessment of our seniors’ papers is that they are improved over past years’ papers. This corresponds with anecdotal information that some of the judges expressed to the effect that the papers “seem to be getting better”. Even though the procedure for the judgment of these papers is comparable to recent years’ assessments, it is unclear whether we can attribute this to recent efforts to improve our undergraduate program. Based on a 2005-06 survey of faculty who teach 400-level classes, it seems fair to say that students do not appear to be well prepared for their upper-level writing assignments (based on the sample of papers that were assessed). Perhaps, since that survey was conducted, faculty who are assigning senior research papers are working more closely with students on these papers to improve the quality; or, perhaps, the caliber of students is improving. These issues and the details of the senior paper evaluations are provided below in Appendix B.

The senior paper assessment procedure, senior paper evaluation report, and evaluation rubric are provided in Appendices A, B, and C, respectively. This assessment process represents the most carefully scrutinized of our majors’ efforts.

In addition to the senior paper evaluations, there are two items on the graduating senior survey departmental insert that provide a further indication of our majors’ abilities with regard to senior papers. A review of the 2006 graduating senior survey shows a positive response to questions to our majors’ writing and research skills. Although these survey results are a more subjective tool for assessment purposes, these results provide another indicator of the department’s success in educating our students.

A review of the 2006 graduating senior survey supplements the senior paper evaluations and reveals a positive response from seniors to questions regarding our majors’ writing and research skills—approximately 90% answering in the affirmative to their undergraduate training. From the survey:

“Our department has several educational goals and expectations related to our sociology and anthropology majors. Some of these are listed below. Please indicate the extent to which you have attained each goal.”

Of the items related to research papers, the survey includes: “Gained expertise in writing papers” and “Research skills for gathering and evaluating evidence about social life/relationships”. The students could choose between the responses:
“Great deal”, “Moderate amount”, “Fair amount”, “A little” and “Not at all”. Of the 60 respondents, 50% and 65%, respectively, chose the highest-ranking response, “Great deal”, for these two items. An additional 38.3% and 28.3%, respectively, chose “Moderate amount” in response to these items. Therefore, approximately 90% of our graduating seniors indicate that they have greatly benefited from their coursework relative to developing writing and research skills.

Section 2 – Actions
The Undergraduate Committee’s related efforts toward improving our undergraduate program along with the evaluation of senior papers are developed in tandem in an iterative process. As we discover strengths and weaknesses in our program, we explore ways to rectify problems and take advantage of the department’s strengths to do so. Our committee has addressed past shortcomings by working more closely with SOC202 instructors to ensure our majors are receiving a solid foundation for subsequent coursework. Also, the undergraduate committee has begun preparing guidelines for courses at each 200-, 300-, and 400-level to provide faculty with tools to facilitate their students’ writing and research skills. These guidelines will comprise our committee’s major assessment efforts during the 2007-2008 academic year.

Our review remains on track in the spirit of the assessment goals. Our plans are to develop basic writing and research skills for our majors at the various course levels. Our senior paper evaluation is the primary tool for assessing our majors’ educational experience this year. Our other sources of information that will be reviewed in our Departmental Comprehensive Review are the UPA reports on the alumni survey and graduating senior survey.

Section 3 – Resources Required
At present, we require no resources to continue our assessment efforts. As we attempt to assess other program outcomes in the future, we may require resources. Although our efforts focus on one program outcome, these efforts tax our committee members’ time and energy. Nevertheless, even with this restricted assessment focus, we believe this process is contributing to an improved undergraduate program.

Appendix A

Assessment Procedures For Evaluation of Senior Term Papers:
Term papers were randomly drawn from select 400-level Sociology courses in the Spring 2006. The courses include Soc404 Work and Family, Soc430 Community and Crime, and Soc450 Environmental Sociology. These courses were chosen as they seemed to have paper requirements of sufficient length (7 to 20 pages) that seem to meet a minimal definition of a term paper. (Some courses were excluded as the required papers were very short, such as multiple 1 page, or 5 page papers). Undergraduate committee members (McCall, Smith, Engen, Atkinson and Curran) in Spring 2007 read and ranked the papers on seven dimensions Thus, each paper had two rankers or “reviewers.” Graduating seniors were randomly drawn from the Spring graduation rolls. The rubric used to evaluate the papers is
Below results are summarized for the evaluations of 28 papers collected in the Spring semester of 2006 from graduating seniors (scheduled to graduate May 2006). Initially, the reliabilities are discussed and then the results presented in comparative format with results from 2002 through 2005. The papers in 2006 represent a random sample of papers in 400-level classes among students graduating in December 2006.

Recall that in the 2004 and 2005 analysis, the reliabilities were relatively low compared to conventional standards and compared to the first year’s reliabilities of the “judge pairs” who read each paper (each paper is read by two faculty “judges” who rate each paper on the 7 criteria). This year, a somewhat different procedure was followed in judging the papers. Initially outliers from the two evaluations were identified and subject to a third reviewer’s evaluation to correct of possible/likely errors in the evaluations. An initial outlier was defined as any paper with an evaluation where the difference in the evaluation is equal to or greater than two categories from the other judge’s evaluation. Approximately 17% of the specific evaluations could be classified as being outliers, involving 16 of the 55 papers reviewed (28 different papers were reviewed twice, with one missing). See Appendix C for further discussion of the handling of outliers. Below results are presented in which the wayward evaluations are omitted, and that of a third judge is substituted (and attributed, for convenience, to the original judge). Table 1 shows the correlation and the reliabilities (Spearman-Brown reliability coefficients) for each of the five judges.

Table 1. Correlations and Spearman-Brown Reliability Coefficients for Five Judges for 2006 Graduating Seniors (based on approximately 12 evaluations per judge).

<table>
<thead>
<tr>
<th>Judge 1</th>
<th>Judge 2</th>
<th>Judge 3</th>
<th>Judge 4</th>
<th>Judge 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>corr reliab</td>
<td>corr reliab</td>
<td>corr reliab</td>
<td>corr reliab</td>
<td>corr reliab</td>
</tr>
<tr>
<td>Topic .754 .860 .286 .445 .485 .653 .739 .850 .639 .780</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organ. .472 .641 .344 .512 .347 .515 .722 .839 .502 .668</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lit Rev. .539 .700 .250 .400 .577 .732 .746 .854 .426 .597</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence .621 .766 .491 .659 .414 .587 .511 .676 .387 .558</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations .714 .833 .758 .862 .747 .855 .870 .930 .735 .847</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammar .612 .759 .516 .681 .530 .693 .741 .851 .592 .743</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall .625 .769 .615 .762 .788 .881 .695 .820 .502 .668</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that these correlations and reliabilities are much higher than in 2005 (when 8 of the 35 correlations were actually negative! – 2005 results not shown here). In 2006 all of the correlations are positive, and none are below .250. Reliabilities of .8 or higher are generally considered “good” and 12 of the 35 reliabilities are
above .8 in the table above. Twenty of the 35 are above .70, and 28 of the 35 are above .6 (which some researchers consider to be a “minimal” reliability level). Judge 2 has 3 reliability scores below .6, and Judges 3 and 5 have 2 reliability scores below .6. Judge 2 has the lowest reliability scores, and Judge 4 the highest. All of the reliabilities for the “overall” classification are above .668, indicating moderately strong agreement as to the overall quality of each paper. No specific criterion stands out as having consistently low reliabilities across the 5 judges. In general, one could conclude that there is room for improvement in the consistency with which the papers are evaluated, but that the level of reliability is adequate for our purposes here.

Below we list the average scores for the four years of evaluation. Note that the evaluations for the years 2004 and 2005 are based on generally low reliabilities.

Table 2. Mean Ratings by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>2002-3</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>3.50</td>
<td>3.41</td>
<td>3.48</td>
<td>3.84</td>
</tr>
<tr>
<td>Organization</td>
<td>3.35</td>
<td>3.60</td>
<td>3.18</td>
<td>3.82</td>
</tr>
<tr>
<td>Literature Rev</td>
<td>3.51</td>
<td>4.08</td>
<td>3.10</td>
<td>4.00</td>
</tr>
<tr>
<td>Evidence</td>
<td>3.47</td>
<td>3.91</td>
<td>3.05</td>
<td>3.96</td>
</tr>
<tr>
<td>Citations</td>
<td>3.13</td>
<td>3.52</td>
<td>3.35</td>
<td>3.73</td>
</tr>
<tr>
<td>Grammar</td>
<td>3.51</td>
<td>3.71</td>
<td>3.43</td>
<td>3.80</td>
</tr>
<tr>
<td>Overall*</td>
<td>3.41</td>
<td>3.67</td>
<td>3.09</td>
<td>3.82</td>
</tr>
</tbody>
</table>

*For 2002-4 “overall” based on average of 6 criteria, whereas in 2005 & 2006 “overall” is based on the specific category “overall, the quality of the paper is…”

A comparison of the results for calendar year 2006 with the 2002-3 academic year indicates that there has been an overall improvement in the quality of the papers since 2002. This corresponds with anecdotal information that some of the judges expressed to the effect that the papers “seem to be getting better”.

Table 3 shows the percent of papers in 2002-3 versus 2006 that receive ratings of “good” or “very good.” As can be seen from the evaluations, the 2006 papers are much better than the 2002-3 papers, with the vast majority of papers being rated highly. The weakest criterion is that of “using citations properly” with only 71.4% of the senior research papers rated highly. The second worst criterion is “organization” (“paper is well organized, develops from original statement to conclusions logically; avoids lengthy tangents”). Caution should be used in interpreting these results, as the evaluations in the earlier years were generally made by different judges than those made in the later years. The early judges may have had “higher standards” in the application of the rubric than the current panel of judges. Also the results represent the rounding of an average of two numbers. Thus, a “good” rating can result from just one judge’s evaluation as “good” even if the other judge thinks it “intermediate”.

Table 3. Percent of Senior Research Papers Rated “Good” or “Very Good” by Year, (all scores x.5 or higher are rounded up, e.g., “3.5” becomes a “4”)
2002-3 2006  
Topic 57.1% 82.1%  
Organization 60.0% 78.6%  
Lit Review 71.5% 96.4%  
Evidence 65.8% 96.4%  
Citations 54.3% 71.4%  
Grammar 68.6% 82.1%  
Overall 50.0% 96.4%  

Whereas the evidence seems to point towards a substantial improvement in the quality of research papers over time, there are several alternative explanations. One is sample selection. Whereas only 9 of the 36 2002-3 course papers (25%) were from one class (SOC430), 21 of the 29 papers (72%) evaluated in 2006 were from that same course. An analysis of the SOC430 papers for 2002 reveals that they are generally rated highly -- comparable (only slightly lower generally) to the overall average of the papers evaluated in 2006. However, somewhat oddly, the SOC430 papers in 2006 are found on average to be below the overall average for papers in that year. SOC404 papers were included in 2006, but not in 2002-3, and they have very high ratings. So, if there are “selection effects” at work, they are of a complex nature that confounds our interpretation of the results. Since only a few courses are involved in the paper evaluation process (3 in 2006; 5 in 2002-3), the results could vary substantially if other classes had papers included in the evaluation. That is, the ratings could be influenced substantially by the sampling of other classes (if other classes had research papers).

Another complication to the interpretation of the data is lack of knowledge about the exact instructions teachers give the students on writing the papers. Perhaps the instructions have improved over the years so that students are learning how to write better research papers because of better instruction. It would be good to know that the teacher’s instructions have improved, as that would bolster our confidence in any claim that the students are learning how to write research papers better due to our instruction. Alternatively, it is possible that the students themselves are better students in the more recent years (e.g., have higher SAT’s and GPA’s). We don’t have much information “handy” on this. However, for 2002-3, the only statistically significant correlation between GPA and a paper evaluation criterion is with grammar ratings (r=.314). So, this would suggest that GPA, at least -- even if higher in 2006 than in earlier years -- may not be a factor in explaining the higher ratings of paper in 2006 than in 2002-3. (Yet, the N’s are low, so perhaps more observations are needed before dismissing GPA as a factor). Further details of the differences across years can be seen in Table 4 below, where descriptive statistics are presented for each of the years studied. Note that in 2006 there are fewer very low scores, and the standard deviations are somewhat smaller than in the earlier years.

Table 4. Descriptive Statistics for 2002-3 (AY), 2004(Spring), 2005(CY) and 2006 (CY)  
A. Descriptive Statistics 2002-3*
<table>
<thead>
<tr>
<th>Criteria</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avetop</td>
<td>36</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5000</td>
<td>0.94868</td>
</tr>
<tr>
<td>Aveorgan</td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.3472</td>
<td>0.98430</td>
</tr>
<tr>
<td>Avelitr</td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.5139</td>
<td>1.01056</td>
</tr>
<tr>
<td>Avevid</td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.4722</td>
<td>0.97793</td>
</tr>
<tr>
<td>Avecita</td>
<td>36</td>
<td>1.50</td>
<td>5.00</td>
<td>3.1250</td>
<td>1.00267</td>
</tr>
<tr>
<td>Avegram</td>
<td>36</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5139</td>
<td>0.81492</td>
</tr>
<tr>
<td>Aveoverall</td>
<td>36</td>
<td>1.92</td>
<td>4.92</td>
<td>3.4120</td>
<td>0.80597</td>
</tr>
</tbody>
</table>

Valid N (listwise) 36

*overall average calculated as average of other six criteria.

B. Descriptive Statistics, Spring 2004

<table>
<thead>
<tr>
<th>Criteria</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avetop</td>
<td>21</td>
<td>2.00</td>
<td>5.00</td>
<td>3.4048</td>
<td>0.93031</td>
</tr>
<tr>
<td>Aveorgan</td>
<td>21</td>
<td>2.50</td>
<td>5.00</td>
<td>3.5952</td>
<td>0.66368</td>
</tr>
<tr>
<td>Avelitr</td>
<td>20</td>
<td>3.00</td>
<td>5.00</td>
<td>4.0750</td>
<td>0.63401</td>
</tr>
<tr>
<td>Avevid</td>
<td>21</td>
<td>3.00</td>
<td>5.00</td>
<td>3.9048</td>
<td>0.60455</td>
</tr>
<tr>
<td>Avecita</td>
<td>21</td>
<td>2.00</td>
<td>5.00</td>
<td>3.5238</td>
<td>0.91482</td>
</tr>
<tr>
<td>Avegram</td>
<td>21</td>
<td>2.50</td>
<td>5.00</td>
<td>3.7143</td>
<td>0.73436</td>
</tr>
<tr>
<td>Aveoverall</td>
<td>21</td>
<td>2.83</td>
<td>4.75</td>
<td>3.6706</td>
<td>0.53908</td>
</tr>
</tbody>
</table>

Valid N (listwise) 20

*overall average calculated as average of other six criteria.

C. Descriptive Statistics, 2005 (CY)*

<table>
<thead>
<tr>
<th>Criteria</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avetop</td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.4828</td>
<td>0.81813</td>
</tr>
<tr>
<td>Aveorgan</td>
<td>28</td>
<td>2.00</td>
<td>4.50</td>
<td>3.1786</td>
<td>0.69674</td>
</tr>
<tr>
<td>Avelitr</td>
<td>29</td>
<td>1.50</td>
<td>4.50</td>
<td>3.1034</td>
<td>0.84915</td>
</tr>
<tr>
<td>Avevid</td>
<td>29</td>
<td>1.50</td>
<td>5.00</td>
<td>3.0517</td>
<td>0.77165</td>
</tr>
<tr>
<td>Avecita</td>
<td>29</td>
<td>1.00</td>
<td>4.50</td>
<td>3.3448</td>
<td>0.83563</td>
</tr>
<tr>
<td>Avegram</td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.4310</td>
<td>0.74071</td>
</tr>
<tr>
<td>Aveoverall</td>
<td>29</td>
<td>2.00</td>
<td>4.50</td>
<td>3.0862</td>
<td>0.66907</td>
</tr>
</tbody>
</table>

Valid N (listwise) 28

D. Descriptive Statistics, 2006

50
N Minimum Maximum Mean Std. Deviation
avetop 28 2.50 5.00 3.8393 .70781
aveorgan 28 3.00 5.00 3.8214 .62678
avelitr 28 2.50 5.00 4.0000 .50918
avevid 28 2.50 5.00 3.9643 .54311
avecita 28 2.50 5.00 3.7321 .63073
avegram 28 2.50 5.00 3.8036 .61372
aveoverall 28 2.50 5.00 3.8214 .51306
Valid N (listwise) 28

As for thoughts on future evaluations, I would like to suggest that we consider adding some criteria to our current list of seven. Since all of the current 7 seem somewhat subjective to me, it might be useful to add a couple of more “objective” criteria. One might have to do with basic sentence structure. Several of the papers seemed to have problems with sentence structure, yet there is no place to evaluate that dimension in the current rubric. Another dimension is the use of transitions (either paragraph to paragraph or from section to section). Other dimensions may be added as well, as the undergraduate committee sees fit.

Appendix C

Sociology Department Paper Assessment Rubric Sheet Paper Number _____
Grader One _____________ Grader Two _______________

Paper Written In: (circle one) ___ Spring 06 ___ Fall 06

Paper was Written For Course SOC_____

Assessment Criteria (Rubric) for Sociology Research Papers from 400-Level Courses (Modified January 31, 2006)

INSTRUCTIONS: Students should be able to clearly state their research question, purpose of the research or hypothesis and collect information necessary to address the research question or hypothesis using library sources, electronic data sources, and/or social science methodologies. ONE: After grading each paper by checking the boxes below, separate your rubric sheets from the pack of papers, place the rubric sheets in an envelope and return them to Bill Smith (mail room, or room 327). TWO: pass on the papers and the blank rubric sheets to the second reviewer listed on the rubric sheet. (Obviously, each Grader should not see the other Grader’s completed rubric sheet.) THREE: Please return all papers after the 2nd reader has graded the paper and all completed rubric sheets to Bill Smith by March 1st, noon.

Please read the assigned paper(s) and rate each paper on each of the seven criteria below.

Criteria (see over for elaboration) 1 Very Poor 2 Poor 3 Intermediate 4 Good 5 Very Good

I. The research question, purpose of research, topic, or hypothesis(es) is clearly
stated, giving a clear idea of what the topic is, and why it should be studied.
II. The paper is well organized, develops from original statement to conclusions logically; avoids lengthy tangents
III. There is a representative scholarly literature review that is relevant to the research question, topic or hypothesis(es).
IV. There is appropriate evidence discussed and marshaled relevant to the research question, topic, or hypothesis(es).
V. The student uses citations properly (attribution of quotations, paraphrases) and in a consistent fashion; no plagiarism.
VI. Paper is consistent with existing standards of written English grammar, syntax, punctuation, and spelling.
VII. Overall, the quality of the paper is:
The reviewers should assess the papers as consistently as possible across the various course assignments. Some clarification of the Seven-point rubric is provided below.

I. The student does not need to summarize the findings (like an abstract) in the introduction, but should provide a clear indication of the paper’s focus. Some may provide an actual topic statement or research question, but the topic may be presented with a paragraph description of the paper’s purpose.

II. This category assesses more the structure than the substance of the paper. Simply put, the paper should proceed with an introduction (statement of the problem), a body focused on the topic at hand, and a conclusion that is derived from the literature review.

III. It is important that scholarly sources provide the evidence for the paper and that the literature selected is representative of the arguments found in the area of study.

IV. A coherent argument should be developed from the literature reviewed for the topic.

V. Credit is given for others’ work; citations provided; quotations used as needed; no hints of plagiarism. The source of the ideas presented should be clear to the reader.

VI. Strict adherence to classic punctuation requirements may be relaxed (with contemporary de-emphasis on use of commas, for example).

VII. This category provides the reviewer with a chance to grade the quality of the student’s work. (The student may be able to satisfy many of the above category requirements without quality.) This is your chance to rate the overall quality.
Degree Program: B.S. in Environmental Sciences

Department: Agricultural and Resource Economics

Curriculum Code(s): ESE

Objectives of the Degree Program:

Goals of the Degree Program:

Outcomes of the Degree Program:

Assessment Activity during the 2006-2007 Academic Year:
The ESE (and NRM) options of the ES and NR inter-disciplinary programs at NCSU are not being assessed by the department as such. The university in 2005, 2006, 2007 has been conducting a thorough review of the ES and NR programs. Recommendations for restructuring all ES and NR degrees/programs are forthcoming from the study group and will probably be implemented for the 2008-2009 academic year.

Degree Program: B.S. in Environmental Sciences

Department: Soil Science

Curriculum Code(s): ESS

Objectives of the Degree Program:

Goals of the Degree Program:

Outcomes of the Degree Program:

Assessment Activity during the 2006-2007 Academic Year:
Continuing assessment activities included review of course and instructor evaluations, peer review of selected courses by faculty review teams and completion of exit interviews of graduating seniors. Restructuring of SSC 361 was initiated with a new team taught approach. This was to take advantage of the expertise of a number of faculty specialties now required of our graduates. This was in part due to the feedback from our employing clientele. The teaching program was a subject of a Departmental retreat wherein all faculty were involved in the review. Discussion of employment opportunities and skill needs was undertaken along with survey results of alumni and employers of our graduates. As an outcome the planning for a new BS degree was initiated. Additional input is now being solicited via a survey of prospective employers as part of the degree planning process. A year long review of the Natural Resources and the Environmental Science degree programs has been a major focus for this year. Three Colleges and 7 Departments
have been involved. The Provost has appointed a new Director to oversee the NR and the ES programs and the review effort. The curricula have been intensively reviewed and proposed changes in the NR and ES courses have been discussed. Marketing and promotional efforts to improve the participation in the programs are being planned. The review process of the existing program and the planning for a significant revision is ongoing.

**Degree Program:** B.S. in Environmental Sciences

**Department:** Zoology

**Curriculum Code(s):** ESC

**Objectives of the Degree Program:**

**Goals of the Degree Program:**

**Outcomes of the Degree Program:**

**Assessment Activity during the 2006-2007 Academic Year:**
Degree Program: B.S. in Extension Education

Department: Agricultural and Extension Education

Curriculum Code(s): AEC/AEX

Objectives of the Degree Program:
The objectives of the degree program are essentially the outcomes listed as sub-components of the goals.

Goals of the Degree Program:
1. Demonstrate appropriate pedagogical and andrological skills in non-formal educational settings.
2. Develop a broad base of agricultural knowledge to be communicated to learners.
3. Apply appropriate instructional technology for specific learning situations.
4. Apply critical thinking to solving educational and agricultural problems.
5. Demonstrate professional dispositions consistent with employer expectations.

Outcomes of the Degree Program:
The specific outcomes of the program are related to the goals listed above. The numbering system will identify the association between goals and outcomes.

Graduates of the Extension Education degree program will be able to:
1.a. select appropriate teaching techniques for specific situations.
1.b. motivate learners to learn.
1.c. adapt instruction to learners with varying learning styles, academic abilities, and cultural backgrounds.
1.d. evaluate learning and provide appropriate feedback to clientele.
1.e. evaluate educational program outcomes and make appropriate revisions for program improvement.

2.a. demonstrate technical knowledge in agriculture.
2.b. demonstrate the ability to guide learners in the solution of agricultural problems.
2.c. communicate agricultural information to learners.

3.a. use a variety of instructional tools to communicate agricultural information.
3.b. use state-of-the-art instructional technology to aid instruction to learners of various abilities and cultural backgrounds.
3.c. use appropriate technology in the agricultural discipline.

4.a. synthesize information from courses and educational experiences to arrive at appropriate solutions to problems.
4.b. develop learning activities to promote problem solving and critical thinking in clientele groups.

5.a. demonstrate fair and ethical treatment of clientele groups they serve.
5.b. participate in professional development and professional improvement activities.
5.c. become involved in professional organizations.

Assessment Activity during the 2006-2007 Academic Year:
1. Conducted an exit survey of students who completed the capstone course in the program, providing feedback on the value of the courses in the program.

2. Conducted personal interviews with the Extension faculty who supervised the internship program to identify strengths and weaknesses of the graduates.

3. Assessed the major projects completed by the students that were designed to demonstrate competency in both subject matter and educational techniques.

4. The findings of the assessment activities indicated a need for more structure in the internship experience. An internship manual is being developed to serve as a guide for activities and responsibilities of Extension interns. This manual will serve to provide more consistent or standardized experiences for Extension interns.
Degree Program: B.S. in Food Science
Department: Food Science
Curriculum Code(s): SFS/TFS

Objectives of the Degree Program:
The objectives are similar to our outcomes.
1. Students should demonstrate the ability to engage in clear and careful scientific inquiry.
2. Students should demonstrate the ability to apply critical thinking skills to solve problems and generate designs related to food science and technology.
3. Students should demonstrate the ability to understand, manage, and communicate source materials related to food science and technology.
4. Students should be able to work effectively in teams.
5. Students should be able to give effective oral presentations.
6. Students should develop and utilize the personal and professional attributes that mark a successful Food Science graduate.

Goals of the Degree Program:
1. Prepare students for careers in food science and allied fields through instruction in basic sciences and technologies applicable to the food industry.
2. Encourage growth and development in communication skills.
3. Stimulate students to develop skills in critical thinking and the use of judgment in the decision making process.
4. Provide one curriculum that meets the minimum standards for the Institute of Food Technologists (IFT) undergraduate curriculum.

Outcomes of the Degree Program:
1. Students should demonstrate the ability to engage in clear and scientific inquiry.
2. Students should demonstrate the ability to apply critical thinking skills to solve problems and generate designs related to food science and technology.
3. Students should demonstrate the ability to understand, manage, and communicate source materials related to food science and technology.
4. Students should be able to work effectively in teams.
5. Students should be able to give effective oral presentations.
6. Students should develop and utilize the personal and professional attributes that mark a successful Food Science graduate.

Assessment Activity during the 2006-2007 Academic Year:
The department participated in a Comprehensive Review (CSREES) including the undergraduate program review in March, 2007. The chapter on undergraduate education, the review of the review team relative to undergraduate education, and the departmental response are attached. Dr. Allen DuPont, Director of Assessment, Undergraduate Studies, and Dr. Jon Rust, Professor and Associate Head of Textile Engineering and Science participated in this external review. This report is also attached.
2. Assessment methods:
   a. Faculty surveys to evaluate students abilities to meet curricular outcomes
   b. Graduating senior survey (conducted by the university with questions related to the department included)
   c. Exit interviews conducted by department head or associate head
   d. Industry interviewer survey for permanent and internship positions
   e. CSREES review team meeting with undergraduate students

3. Brief summary of results:
   a. Undergraduate committee expanded to include instructors for all “core” food science courses
   b. Restructured faculty evaluation of students’ abilities related to curricula outcomes and placed the evaluation on-line.
   c. Undergraduate teaching retreat in fall 2006 and discussed undergraduate assessment and methods to improve students’ abilities to meet these outcomes
   d. Encourage the use of inquiry-guided learning in additional courses
   e. Established a uniform system for laboratory notebooks, reports, and grading rubric
   f. Modifications to various courses to improve any deficiencies in the curricular outcomes
      • FS 231, incorporated additional writing assignments and changed to a two-stage review process and improve teaching/learning aspect,
      • FS 290, additional lecture material to assist in visual material preparation and oral presentations,
      • FS 405, addition of homework and term paper assignments to increase writing and library research skills,
      • FS 475, change in lecture content, addition of more case studies, addition of individual writing assignments, addition of weekly oral reports.
      These modifications are targeted at addressing curricular outcomes thus tying together the course level and program level outcomes.
   g. The internal undergraduate review conducted by Dr. Allen DuPont noted that, while the undergraduate committee was meeting and working to continually improve the curricula, insufficient minutes were being taken to reflect this process. Improved minute recording will be implemented on July 1, 2007.
**Degree Program:** B.S. in Horticultural Science

**Department:** Horticultural Science

**Curriculum Code(s):** SH/THG/THL

**Objectives of the Degree Program:**
To offer students basic and applied educational opportunities that will prepare them both personally and professionally for various activities in horticulture.

To create an environment where students can develop skills and attributes they will need as horticultural professionals.

**Goals of the Degree Program:**
To develop attributes that mark a successful horticultural professional in the field including:

- a knowledge base in horticultural science that allows them to communicate and solve problems related to basic horticulture;

- the self-confidence in their professional expertise that gives them the ability to make decisions and to carry out those decisions;

- the values that lead them to use their educational experience to become good citizens of their communities;

- the desire to continue to seek out educational opportunities and to grow both professionally and personally;

- the drive to develop, hone, and exercise leadership potential; and

- the ability to make evaluative judgments and both give and graciously receive constructive criticism.

**Outcomes of the Degree Program:**
1. Students should demonstrate the ability to understand and communicate information from the horticultural sciences in oral and written form, and communicate these to scientific and nonscientific audiences.

2. Students should demonstrate the ability to engage in clear and careful scientific inquiry.

3. Students should demonstrate the ability to apply critical thinking to solving problems and generating designs related to Horticultural Science.

4. Students should have the qualifications to enter graduate schools or to obtain employment in their chosen specialty or field of interest.
5. Graduating seniors should be satisfied with the education they received from the Department of Horticultural Science.

Assessment Activity during the 2006-2007 Academic Year:
1. Graduating senior exit interviews were conducted at the end of each semester and information was summarized and reported to the Department Head and the Undergraduate Program Committee.

2. Undergraduate students in Horticulture were surveyed concerning a proposed new curriculum concentration in Landscape Contracting. Data from the survey will help us adjust the new concentration proposal before it is submitted to the CALS this fall.

3. Student performance was evaluated through class exams and assignments. Specific issues were discussed in the Undergraduate Program Committee.

4. Teaching faculty met monthly to discuss student performance, exit interview data, and information obtained from other sources.

5. Student course and instructor evaluations, University Sophomore and Senior Survey data were consulted and evaluated.

6. Student Horticulture Club, Pi Alpha Xi, and PLANET Landscape competition team officers were consulted regarding the undergraduate program and given the opportunity to give input about courses, curriculum options and other departmental programs.
Degree Program: B.S. in Microbiology

Department: Microbiology

Curriculum Code(s): SMB

Objectives of the Degree Program:
Graduates should be able to:
I. demonstrate a sound working knowledge of the field of microbiology.
II. demonstrate a command of the skills necessary to perform effectively and safely in a microbiology laboratory.
III. understand, manage, and apply information about microbiology from both scholarly and popular sources and to communicate their understanding clearly and coherently for different audiences.

Goals of the Degree Program:
The goals of the program include the prepare students for further study in professional or graduate school or for employment that utilizes their skills in microbiology. We seek to encourage the continued development of students' communication skills, and to stimulate critical and ethical thinking. We also intend to provide a curriculum that meets the recommendations of the American Society for Microbiology.

Outcomes of the Degree Program:
Upon graduation, microbiology majors should be able to:

I. demonstrate a sound working knowledge of the field of microbiology.
   Subsets of this objective are:
   a. to show that they have acquired a foundational knowledge of microbiology that allows them to continue to grow in the field.
   b. to show that they can apply their foundational knowledge in microbiology when challenged with new situations by asking intelligent questions that lead to an understanding of the new situations.
   c. to show that they can synthesize from the answers to those questions new knowledge about microbiology.

II. demonstrate a command of the skills necessary to perform effectively and safely in a microbiology laboratory. Subsets of this objective are:
   a. to show that they have mastered the techniques essential to sound laboratory practice.
   b. to show that they can apply deliberate and thorough observational skills to conduct experiments and collect data.
   c. to show that they can organize and summarize data and present them in a way that is accurate and comprehensible in both verbal and graphical modes.
   d. to show that they can interpret data and draw conclusions that allow the students to support or refute hypotheses and make a case for alternative hypotheses.
III. understand, manage, and apply information about microbiology from both scholarly and popular sources and to communicate their understanding clearly and coherently for different audiences. Subsets of this objective are:

a. to show that they can effectively explain information related to microbiology in the popular press to non-scientific audiences.

b. to show that they can summarize the important information from scientific articles.

c. to show that they can make a critical judgment of scientific material, using as support their analysis of its research questions and hypotheses, the appropriateness and precision of its research methods, the effectiveness of its presentation of results, and the interpretation and conclusions it draws from the results insofar as they answer the research questions.

d. to show that they can effectively organize and make sense of scientific information from multiple sources, raise pertinent questions about that information, and draw appropriate and useful conclusions from it.

e. to show that they can find suitable scientific sources for answering questions about microbiology, evaluate the pertinence, value, and credibility of those sources, and make a convincing case for their answers using evidence from the sources.

Assessment Activity during the 2006-2007 Academic Year:
Degree Program: B.S. in Natural Resources
Department: Agricultural and Resource Economics
Curriculum Code(s): NRM

Objectives of the Degree Program:
Goals of the Degree Program:
Outcomes of the Degree Program:

Assessment Activity during the 2006-2007 Academic Year:
The NRM (and ESE) options of the ES and NR inter-disciplinary programs at NCSU are not being assessed by the department as such. The university in 2005, 2006, 2007 has been conducting a thorough review of the ES and NR programs. Recommendations for restructuring all ES and NR degrees/programs are forthcoming from the study group and will probably be implemented for the 2008-2009 academic year.

Degree Program: B.S. in Natural Resources
Department: Soil Science
Curriculum Code(s): NRS/NRW

Objectives of the Degree Program:
Integrate a strong basic science background with an understanding of soil properties to prepare graduates to apply a scientific approach to land management for maintaining or enhancing environmental quality.

Goals of the Degree Program: see objectives

Outcomes of the Degree Program:
1. Understand the basic physical, chemical and biological properties of soil
2. Apply the principles of science in soil and land management for maintaining or enhancing environmental quality
3. Communicate proficiently and in a manner required of soil scientists

Assessment Activity during the 2006-2007 Academic Year:
Continuing assessment activities included review of course and instructor evaluations, peer review of selected courses by faculty review teams and completion of exit interviews of graduating seniors. Restructuring of SSC 361 was initiated with a new team taught approach. This was to take advantage of the expertise of a number of faculty specialties now required of our graduates. This was in part due to the feedback from our employing clientele.
The teaching program was a subject of a Departmental retreat wherein all faculty were involved in the review. Discussion of employment opportunities and skill needs was undertaken along with survey results of alumni and employers of our graduates. As an outcome the planning for a new BS degree was initiated. Additional input is now being solicited via a survey of prospective employers as part of the degree planning process.

A year long review of the Natural Resources and the Environmental Science degree programs has been a major focus for this year. Three Colleges and 7 Departments have been involved. The Provost has appointed a new Director to oversee the NR and the ES programs and the review effort. The curricula have been intensively reviewed and proposed changes in the NR and ES courses have been discussed. Marketing and promotional efforts to improve the participation in the programs are being planned. The review process of the existing program and the planning for a significant revision is ongoing.
Degree Program: B.S. in Nutrition Science

Department: Food Science

Curriculum Code(s): NTS

Objectives of the Degree Program:
Graduates should demonstrate:
1. A sound working knowledge of nutrition and its associated fields.
2. The ability to engage in scientific inquiry and problem-solving related to nutrition.
3. The ability to find, understand, evaluate, and communicate information from primary and secondary source material in both oral and written format
4. Satisfaction with their education in Nutrition Science major relative to their ability to meet their own personal and professional goals.

Goals of the Degree Program:
The goals of the degree program are to provide:
1. A strong foundation in basic science.
2. Competency in the various areas of nutritional sciences, including nutritional and metabolic biochemistry, comparative nutrition, community and life cycle nutrition, global food production and distribution, and nutritional chronic disease impacts.
3. A broad general education in areas ancillary to nutritional sciences, such as public policy development, lay and technical writing, media presentations interpersonal communication, concepts of human and group dynamics, public speaking, psychology, needs of diverse populations, and economics.
4. Multiple opportunities to develop laboratory, computer, oral and written communication skills, knowledge of the scientific method, data analysis and evaluation, and critical thinking and problem-solving skills.
5. A curriculum that will enable students to be successful in a research, corporate, technical, governmental, or non-profit environment as a nutritionist or other human health-related professional.

Outcomes of the Degree Program:
1. Students will be able to write clear, accurate responses to exam and homework questions in Nutrition Science courses.
2. When presented with a problem relevant to Nutrition Science, students will be able to determine what information is appropriate to solving the problem and use it effectively.
3. Students will be able to find, evaluate the validity of, and summarize data/information from multiple sources and present it effectively in written and/or oral form.
4. Upon reflection on the education they received from their Nutrition Science major, 80% or more of the responding students will be Very or Moderately Satisfied with their overall education in the degree program relative to their ability to meet their own personal and professional goals.
Assessment Activity during the 2006-2007 Academic Year:
As the major is new we are just beginning to develop an action plan for evaluation of the outcomes associated with the degree program.

For outcomes 1-3:
Faculty responsible for teaching nutrition courses will meet twice a semester to discuss students’ abilities in these areas as documented by exams, homework assignments, research papers, and oral presentations, and consider changes in approaches both within the courses and across the curriculum to better meet those outcomes. Information from alumni and graduating senior surveys will also begin to be collected on items in the category of Knowledge, Skills and Personal Development, such as NCSU’s contribution to their ability to apply the scientific method, and critically analyze ideas and information.

For outcome 4:
Data will be gathered from aggregate on-line instructor and advisor evaluation instruments as well as from the graduating senior and alumni surveys.
Degree Program: B.S. in Plant Biology

Department: Plant Biology

Curriculum Code(s): SBO/SPB

Objectives of the Degree Program:
As the basic plant science department in the College of Agriculture and Life Sciences (CALS), Plant Biology has high priorities in teaching and research with only a peripheral extension commitment. The departmental faculty, by design, currently encompasses an array of interests and expertise directed toward the study of plant structure, developmental processes, functions, and interactions with other organisms and abiotic factors. A significant part of our mission is to convey knowledge concerning the aforementioned areas to students at both the undergraduate and graduate levels, the latter to include international students. Teaching is directed at stimulating students to ask scientific questions and at sharing basic concepts and current knowledge to enable them to answer these questions. Undergraduate and graduate student clientele enrolling in our courses include both science majors and non-science majors. The primary objective of research conducted by the faculty is to generate new knowledge, which may have immediate, long-term, or unknown application. Interaction with other NCSU departments and programs occurs with regard to both academic and research activities as opportunities become apparent. Further opportunities for research interactions occur at local, state, national, and international levels. These constitute important components of our overall mission.

Goals of the Degree Program:
The Plant Biology curriculum provides students the opportunity for training both in the laboratory and in field experiences in all aspects of the biology of plants including basic cellular and molecular biology, morphology, physiology, ecology, and classification. The curriculum focuses mainly on flowering plants, but also addresses plant and non-plant types such as algae, fungi, and other non vascular plants. The curriculum allows students flexibility in choosing a more laboratory-related experience or a more field-oriented experience depending on their personal preferences or career objectives. Students also are required to have either (some choose both) a research or teaching experience to help them develop skills in these areas and to make decisions about potential career opportunities.

Outcomes of the Degree Program:
Upon completion of the Bachelor of Science degree in Plant Biology, graduates will be able to:
1. Understand science-related issues and communicate these to scientific and nonscientific audiences in an understandable way in both written and oral form
2. Have the qualifications to enter graduate schools or to obtain employment in their chosen specialty or field of interest
3. Have basic written and oral communication skills and interpersonal skills that are necessary for success in employment and in their personal life
Educational processes responsible for achieving the intended student outcomes:

1. Students take all General Education requirements including English, communication or language electives, 21 hrs of Social Sciences and Humanities, Math, Chemistry, Physics, Statistics, Biology, Genetics, and Physical Education. In the Plant Biology requirements, they take PB 101 (Perspectives on Plant Biology), PB250, and at least three additional courses, one of which must be from 300 level or above. An additional selection of courses, which include courses in Zoology, Biochemistry, Geology, Soil Science, Food Science, Agricultural Resources, Horticulture, Plant Pathology, and Entomology, provide students opportunities to broaden their plant biology perspective to include either more detail of plant functions, interaction of plants with other organisms, economics of plants, plants and their environment, etc. Students usually select courses that enhance their skills and give them potential for various career opportunities.

2. Students are required to fulfill a teaching or research opportunity. Teaching is accomplished by teaching one or more of our undergraduate laboratories, either in PB 200, 365, or 421. They may do research in a faculty member’s lab, in industry, or governmental arenas.

3. Students are provided opportunities to participate in the Botany Club where leadership, social interactions, and organizational and interpersonal skills may be developed.

4. Many of our courses have laboratory experiences where students write reports, do hands-on experiments, learn to use certain instruments, interact with other students and faculty, communicate verbally.

Assessment Activity during the 2006-2007 Academic Year:
The Department of Plant Biology underwent a Comprehensive review in Fall 2006, including a review of undergraduate programs. The following link provides access to the Department’s Comprehensive Review Document:

http://cals.ncsu.edu/plantbiology/plantbiologydeptreview.pdf

Information on Plant Biology Undergraduate Programs can be found on pages 55-84.

The Department of Plant Biology uses various methods and tools to assess the three primary program educational outcomes listed above. A table showing the methods of assessment and evidence of accomplishment for each program outcome can be found at the following:

http://cals.ncsu.edu/plantbiology/UAPR/UAPR.html

Departmental Comprehensive Review Report on Plant Biology Undergraduate Education
The following is a summary of the specific recommendations made by the
comprehensive review team relevant to undergraduate program assessment:

• Revise undergraduate program outcomes to include higher-level thinking about the concepts and processes of plant biology and in addition to self-report data, develop assessments that directly evaluate students' achievement of the outcomes in courses and the curriculum.

• Redefine the goals and outcomes of the undergraduate research and teaching experience that reflect the high potential and expectations for students, and develop assessments that provide direct evidence of students' achievement.

• Evaluate the undergraduate curriculum and establish an upper division core of courses that encourages students to focus more deeply within the field of plant biology. All undergraduate students in the major should be required to take a course in evolution, regardless of whether they emphasize cellular or organismal biology in the plan of study.

Departmental Response to the Review Relative to Undergraduate Education

General Response:
The review team recommended that we revise our undergraduate program, focusing on core requirements and the need for courses in evolutionary biology. As part of the planning process for the review, we have begun evaluating our undergraduate major requirements and course offerings. Spring semester 2007 we offered a special topics course on Plant Evolutionary Biology, taught by a part-time instructor. We are also recruiting for a new faculty position in Evolutionary Ecology, which will further strengthen our offerings in evolutionary biology. Our faculty currently serve on the College’s task force charged with revising the undergraduate life sciences core curriculum. Further revisions made to our core will await completion of the life sciences core curriculum, as our curriculum and courses are fully integrated with the biology curriculum.

The review team recommended that the department consider developing and offering general courses relevant to a broader undergraduate audience. The department already contributes considerable effort to teaching general courses for students in the College, including not only BIO 181/183, but also general courses in Cell Biology, Ecology, Video Microscopy, and Confocal Microscopy, none of which are limited to plants. The biotechnology program already offers general courses in biotechnology. The new evolutionary ecology position will be charged with teaching a general course in evolutionary ecology, that focuses broadly and not just on plants.

The review team recommended that the department revise our assessment program. We note that the department is following our approved assessment process for the undergraduate program. The Undergraduate Program Committee has been charged with reviewing our current assessment procedures and recommending changes if appropriate.
Degree Program: B.S. in Poultry Science

Department: Poultry Science

Curriculum Code(s): SPS/TPS

Objectives of the Degree Program:
Objective 1: Poultry Science students and graduates will have a fundamental understanding of biology, physiology, nutrition, genetics, toxicology, and pathology as they relate to the life sciences in general and the various species of poultry in particular. In addition they will have a fundamental understanding of the emerging social and environmental issues associated with animal production agriculture.

Objective 2: Graduates will succeed in obtaining professional or management employment positions in the poultry industry and / or related animal production agriculture discipline areas or entry into graduate or professional school.

Goals of the Degree Program:
The goals of the Poultry Science undergraduate degree program are to meet and to document that the objectives described above are met on a year to year basis and are modified as necessary based on evolving needs of society.

Outcomes of the Degree Program:
After completing the B.S. in Poultry Science, students will be able to:

1. Effectively and efficiently identify and apply relevant appropriate knowledge to address societal and industrial needs and problems associated with the sustainability and growth of poultry production agriculture.

2. Effectively and efficiently prepare written materials and communicate (verbally and otherwise) using resources, methods, and media that are state-of-the-art and effective for the appropriate target audience.

3. Effectively and efficiently work with colleagues, peers, and others, as related to addressing identified objectives.

Assessment Activity during the 2006-2007 Academic Year:
Assessment activities for the referenced outcomes included examinations, internship assessments by faculty advisors and industry partners, course evaluations, exit interviews and inputs from the poultry agribusiness industry seeking SPS and TPS graduates. In general the results show that the objectives of the degree programs are being met, however the number of graduates available to meet industry demand is insufficient. The results also show that it is necessary, for efficiency and to better meet the goals of the degree program, to restructure some of the undergraduate PO courses.

Salient assessment and action items follow:
Course and instructor evaluations for Fall 2006 show that for the Department of Poultry Science the average score for overall effective teacher was 4.72/5.00 (with 5.00 as highest score) and 4.69/5.00 for overall course (and lab).

To enhance recruitment of students for poultry science curricula the department initiated the "Poultry Science Summer Institute" targeting prospective high school students with an interest in poultry science. The initial class is full with 19 students accepted; 13 females, 6 males, and representing 14 NC counties. This institute will be critically assessed during the upcoming academic year.

The department is proposing through necessary university channels that PO 420 Turkey Production and PO 423 Broiler Production be merged. PO 420 and 423 were 2 credits each. The new course, PO 424, is suggested to be listed at 3 credits.

Continued assessment for the 2006-2007 academic year will again involve:

Assessment activity will primarily focus on:

1. Evaluating student performance through class exams, assignments, internships and special topic projects.

2. Success of career placement of graduates.

3. Solicited input from the poultry industry to determine how well the graduates are prepared for the work place.

4. Peer review (internal and external evaluators) of the undergraduate program to evaluate class content relevant to meeting the short and anticipated long term needs of society and agribusiness as related to poultry science.
Degree Program: B.S. in Turfgrass Science

Department: Crop Science

Curriculum Code(s): TFG

Objectives of the Degree Program: To provide a basic and applied science education that prepares our graduates for professional careers in the turfgrass industry within North Carolina and around the world.

Goals of the Degree Program:
1. To become familiar with and understand the cultural requirements of the various species used as turfgrasses.
2. To develop a detailed understanding of turfgrass ecology, integrating the plant, soil, and aerial environments, and then being able to apply this knowledge to management decisions.
3. To develop the ability to recognize biotic and abiotic stresses and their symptoms in turfgrasses and make appropriate management decisions.
4. To develop the ability to communicate proficiently and professionally.

Outcomes of the Degree Program:
1. Graduates will be able to describe how various turfgrass species grow and develop.
2. Graduates will be able to describe how natural resources affect management practices at a regional and global scale.
3. Graduates will be able to develop economically sound management plans for various turfgrass enterprises.
4. Graduates will be able to develop environmentally sound crop management plans for various turfgrass enterprises.
5. Graduates will be able to identify weeds, diseases, and insects that have the potential to cause economic or aesthetic loss to turfgrass.
6. Graduates will be able to identify plant symptoms of disease and insect infestations and abiotic stresses for turfgrass.
7. Graduates will be able to make pest management recommendations that do not adversely harm the environment.
8. Graduates will be able to write reports and business correspondence in a manner acceptable in their professions.
9. Graduates will be able to prepare and confidently present oral reports.
10. Graduates will be able to interact confidently and effectively in various professional settings.

Assessment Activity during the 2006-2007 Academic Year:
Assessment of some of our goals will come from evaluating student performance through class exams and assignments. Other assessment tools include success of job placement and alumni (2-5 years post graduation) and employer surveys, to determine how well our graduates are prepared for the work place. We will also continue peer review of teaching to evaluate class materials and will bring in...
evaluators from outside the university system to critically review our curricula and courses.

We had discussions with seniors and graduates from our programs during the academic year. Most agree that the senior seminar offers a good overview of professionalism and career preparation. However, all agree that the course content comes too late in their academic schedule and that students would be better prepared for internships and job interviews if this course were moved to the sophomore year. As a result, we will create a 1-hour Perspectives and Professional Development course for sophomores in the Agronomy and Turfgrass Science curricula.
Degree Program: B.S. in Zoology

Department: Zoology

Curriculum Code(s): SZO

Objectives of the Degree Program:
1. Graduates should have strong skills in writing and speaking.
2. Graduates should have a firm grounding of knowledge in broad areas of the zoological sciences (animal diversity, cell and developmental biology, animal anatomy and physiology, and ecology/evolution/behavior), and also specialized advanced knowledge in at least one area of their choosing.
3. Depending on their career goals, graduates should be competitive for (a) admission to post-graduate study and/or (b) employment upon completion of the B. S. degree.

Goals of the Degree Program:
Our goal is to have graduates that communicate well, have a strong knowledge of zoology at the Bachelor’s degree level, and who are competitive in pursuing their subsequent career goals.

Outcomes of the Degree Program:
1. Outcomes addressing Objective 1
Desired Outcome 1: Graduates’ self-assessment indicates satisfaction with their overall writing skills. Assessment and data: Senior survey, Question 1. In addition, Questions 2-8 give information on contribution of parts of the curriculum judged effective in affecting this outcome.
Desired Outcome 2: Graduates will (a) clearly state the main argument or purpose of a given written exercise, as appropriate for that particular writing sample, (b) use generally accepted grammatical construction and spelling, (c) show clear organization of thoughts or arguments in writing, as appropriate for the writing assignment.
Assessment materials: Writing samples from courses in zoology. For each of the above outcomes a-c, writing samples will be appraised on a 1-4 scale (1 = strongly disagree the desired outcome is demonstrated, to 4 = strongly agree the desired outcome is demonstrated).

Desired Outcome 3: Graduates’ self-assessment indicates satisfaction with their overall speaking skills. Assessment and data: Senior survey, Question 9. In addition, Questions 10-17 give information on contribution of parts of the curriculum judged effective in affecting this outcome.
Desired Outcome(s) 4: Graduates will (a) clearly state the main argument or purpose of a given speaking exercise, (b) use generally accepted grammar in oral communication, (c) show clear organization of thoughts or arguments in speaking, as appropriate for the speaking assignment.
Assessment materials: Speaking assignments in zoology courses. The instructor of the courses will use rubrics to appraise at least the above outcomes a-c. The Assessment Officer and/or another faculty member may also attend the speaking events.

Outcomes addressing Objective 2

Desired Outcome 5: Graduates’ self-assessment indicates satisfaction with their overall level of general knowledge of zoology. Assessment and data: Senior survey, Question 18.

Desired Outcome 6: Graduates demonstrate a broad base of knowledge about zoology. Assessment materials: A sample of final examinations completed in ZO 150, 160, 250, and 260 by graduates in a current year. Data: Using particular questions applicable to this outcome, the assessor will rate each examination (1 = strongly disagree to 4 - strongly agree) on the following statements:
(a) This student demonstrates strong knowledge of animal diversity
(b) This student demonstrates strong knowledge of cellular and developmental zoology
(c) This student demonstrates strong knowledge of animal anatomy and physiology
(d) This student demonstrates strong knowledge of ecology, evolution, and behavior

Desired Outcome 7: Graduates’ self-assessment indicates satisfaction with their advanced knowledge in at least one advanced area of their choosing. Assessment and data: Senior Survey, Question 19.

Desired Outcome 8: Graduates demonstrate knowledge of at least one advanced area of their choosing. Assessment materials: A sample of final examinations of graduates in advanced courses. Data: Using particular questions applicable to this outcome, the assessor will rate demonstration of knowledge in each examination (1 = strongly disagree, etc.)

Outcomes addressing Objective 3

Desired Outcome 9: Graduates applying to graduate and professional schools show acceptance rates about equal, at least, to the national average (when known). Materials and data: Senior survey, indicating percent acceptance to the following programs:
(a) Medical school
(b) Dental school
(c) other schools related to human health (Optometry, Physical therapy, Pharmacy, etc.)
(d) Veterinary Medicine school
(e) Graduate school (Masters and Doctorate, combined)
(f) other post-graduate programs of study (e.g., law school)

Desired Outcome 10: Graduates entering the workforce find jobs satisfactory to
them. Materials and data: Senior survey, percent of graduates who say they have actively sought a job who have found a job satisfactory to them.

**Assessment Activity during the 2006-2007 Academic Year:**
We will continue an exit interview with each graduating Fall and Spring class, in which the Head and the Undergraduate Coordinator, only, meet with the graduates to engage in a frank and open-ended conversation with the students. That interview also has a written questionnaire regarding the strengths and weaknesses of our program. That interview session complements ongoing, daily, formal and informal assessment via conversations with students in advising events, written course evaluations, and other settings.