

CLEMSON UNIVERSITY

**SUMMARY REPORT
ON
INSTITUTIONAL EFFECTIVENESS**

**SUBMITTED TO
COMMISSION ON HIGHER EDUCATION**

AUGUST 2002

This Summary Report on Institutional Effectiveness, 2002, for *Clemson University* includes: General Education, Majors or Concentrations, Performance of Professional Programs, and Performance of Transfer Students from Technical Colleges.

Pursuant to the information from the SC Commission on Higher Education, the reporting schedule has been modified. The following reporting cycle displays the components reported in the past as well as planned cycle. From 2001 and forward, Library Resources, General Education, Student Development, and Academic Advising will be reported in 4-year cycles as shown below as stated by the CHE staff.

Component	Revised						
	1999	2000	2001	2002	2003	2004	2005
1. General Education (1998)				X			
2. Majors or Concentrations	X	X	X	X	X	X	X
3. Performance of Professional Programs	X	X	X	X	X	X	X
5. Academic Advising	X	X	X			X	
12. Procedures for Student Development		X			X		
13. Library Resources and Services	X		X				X
Performance of Transfer Students from Technical Colleges		X		X		X	
Self-Reporting Alumni Placement			X		X		X

Component 1 General Education

Measures and Strategies

1. 2002 Clemson University Self Study

In 2002, Clemson engaged in a Self-Study for reaffirmation by the Southern Association of Colleges and Schools (SACS). As part of this self-study, a committee reviewed general education at Clemson; a synopsis of their findings is presented.

At Clemson University, general education is an important part of the undergraduate academic program. As such, its scope and sequence is periodically reviewed. A faculty panel has recently completed such a review, and recommendations for revision have been made. The Office of the Provost has also begun to conceptualize the position of assistant dean for general education and curriculum in preparation for the possible creation of such a position.

Clemson University's General Education requirements include a total of 41 semester hours. The core includes two humanities courses, two social science courses, two physical or biological science courses (each with a laboratory), and two mathematical science courses. The core requirements also include six semester hours of English composition, three semester hours of oral communication, three semester hours of writing intensive course work, and three semester hours of computer skills. In each case, before a course appears on the list of courses that satisfy these general education requirements, a subcommittee of the University Undergraduate Curriculum Committee has scrutinized it. The key consideration in the course-approval process is the degree to which the course meets the competency goals in the area. Competency goals for these requirements are presented in the *Undergraduate Announcements 2001-2002* (p. 29). Completion of degree requirements is documented through student Degree Progress Reports (DPR's) which are reviewed for completion by the Registrar's Office prior to the awarding of the undergraduate degree.

The Clemson University General Education Subcommittee, composed of faculty from throughout the University, assesses the effectiveness of the General Education requirements in producing graduates who are competent in mathematics, speaking, writing, reading, and use of computers. Assessment plans have been developed for each General Education area by the faculty serving on each committee.

Multiple strategies are used to assess general education competencies. One of the first measures adopted, originally to provide longitudinal data, was the College Basic Academic Subjects Examination (C-BASE). C-BASE has sections on English, mathematics, science, and social studies. In 1998, C-BASE was administered to 802 Clemson students, to 1673 students in 1999, and to 966 students in 2000. In all three years, students were chosen to represent a cross-section of all majors. The national mean score for C-BASE is adjusted to 300, so any score over 300 indicates better-than-average performance in an

area. Clemson also compares itself with 8 institutions that administer this test. In 1998 and 1999, these institutions were Louisiana Tech University, Ball State, University of Memphis, University of Missouri-Columbia, St. Louis University, University of Utah, Washington University, and the University of Tennessee-Knoxville. In 2000, the University of Mississippi replaced Louisiana Tech University.

Clemson students do well on the C-BASE test, almost always exceeding the national average, and usually exceeding the scores of the comparable institutions as well. For example, the *General Education Findings and Recommendations* report (September 1, 2000, p. 1) shows that Clemson students exceeded the national average in 30 of 36 scores. On 24 out of 36 scores, Clemson exceeded *both* the national and comparable institutions' means. Table 1 (taken from the *C-BASE 2000 Administration*, p.13) gives details on the mean scores of Clemson students as compared with the students of the eight peer institutions. Clemson students have especially strong performance in science. Social studies in 1998, mathematics in 1999, and English in 2000 were weaker areas. However, note that Clemson students scored above the national mean (300) in all areas except social studies in 1998 and English in 2000. Despite the generally positive results from the administration of the C-BASE, committee members felt that lack of student motivation—the administration of C-BASE is divorced from specific course requirements—might have had a negative impact on student performance.

Table 1
Overall median scores on C-BASE administered to Clemson (CU) seniors
and seniors of eight comparable institutions

Subject	1998		1999		2000	
	CU	Comparison Institutes	CU	Comparison Institutes	CU	Comparison Institutes
English	308	306	307	307	293	317
Mathematics	328	312	304	316	325	333
Science	354	305	354	305	350	313
Social Studies	299	304	312	303	309	309

Competencies

Writing. Writing is an important component of Clemson’s general education. As TIME Magazine’s Public College of the Year, Clemson was cited for its communication across the curriculum. A component of the communication is writing. Several strategies are used to assess the writing component of the general education competencies. Although the C-BASE does not require writing samples, it does have objective questions on “Writing as a Process” and “Conventions of Written English.” Clemson students score consistently above the national mean (300) on these assessments (Table 2).

Table 2
Clemson Juniors and Seniors Mean
C-BASE* Writing Scores

	1998	1999	2000
Writing as a Process	309	311	306
Conventions of Written English	309	313	310

*College Basic Academic Subjects Examination

There are also assessment data from student writing samples. Clemson designates some courses as “writing-intensive.” The *General Education Findings and Recommendations* (September 1, 2000, p. 9) describes how 118 students from these courses submitted writing samples that were evaluated by an interdisciplinary team of readers in 1998. The goal of the committee concerned with assessment of General Education writing competency was that 90% of the students would achieve a score of 2 or more on a 4-point scale. The goal was attained by 97.4% of the students. The scores were 18.6% “4,” 48.7% “3,” 30.1% “2,” and 2.6% “1.” More exact specifications of what these scores mean can be found in *Assessment of General Education, 2000-2001* (p. 21).

Some alumni survey results (2000 *General Education* report, p.10) also relate to writing achievement. The percentage of students in writing-intensive courses who either “agreed” or “strongly agreed” with the statements below appears in parentheses following each statement:

- Writing assignments in this course improved my learning of course material (61.6%)
- Receiving constructive feedback on my writing in this course and being given the opportunity to revise my writing enabled me to improve my writing (47.4%)
- Because of this course, I have increased confidence in my ability to meet the demands of writing in my chosen profession (50.6%).

Clemson alumni generally feel that Clemson equipped them with a basic mastery of writing. The results in Table 3 are taken from the report *Assessment of General Education, 2000-2001* (pp. 3, 9 and 15). Table 3 provides the percentage of alumni one-year from graduation who rated Clemson’s contribution on their ability to deal with writing tasks.

Table 3
Clemson Alumni Survey: Written Communications, 2000

Clemson contributed to my ability to:	V or S	L or N
Use correct grammar, including appropriate sentence length, complexity, and variety.	85%	15%
Use basic mechanics such as punctuation and spelling correctly.	85%	15%
Effectively use library resources, including databases.	77%	23%
Incorporate existing research into your own writing, citing appropriate documentation.	90%	10%
Write clearly and effectively.	94%	6%
Organize thoughts when writing.	94%	6%

V or S: Contributed “very much” or “somewhat” L or N: Contributed “little” or “not at all” prepared

Clemson University faculty continue to consider ways to assess writing competencies. A Clemson Portfolio Research Team is exploring the use of a CLE-enriched electronic portfolio for use for the writing assessment area. The team is led by Professor Kathleen Yancey, Director of the Pearce Center for Professional Communication, and Carla Rathbone, Director of the Collaborative Learning Environment (CLE) of Division of Computing and Information Technology (DCIT).

Oral Communication. All Clemson curricula include at least three credits in oral communication. Depending on the number of credits of oral communication to be awarded by a course, Clemson designates courses as “O-1,” “O-2,” and “O-3,” and the three-credit requirement may be satisfied by any combination of courses that totals three credits.

The 2000 *General Education Report* (p. 13) says that Speech 250 (an “O-3” course) was the only oral-intensive course to report extensive results in 1999. For Speech 250, 18 taped student presentations were scored both by course faculty and peers using the National Communication Association (NCA) “oral competency” assessment instrument, which contains eight competencies. These competencies were skills like narrowing the topic appropriately for the audience and occasion, using appropriate supporting material, and use of vocal variety. The average NCA score was 1.69, which was below satisfactory. In fact, no competency had a mean score in the satisfactory range. Four of the 18 speeches were rated as “satisfactory” or higher. Chemical Engineering 307 (an “O1” course) handed in a small number of student presentations. Results from CHE 307 were similar. Two other measures (on group presentation and independent review of videotapes) were not included in the 2000 report.

The 2000 *General Education Report* (p. 16) makes many recommendations to the faculty of oral-intensive courses to improve the performance of their students. These included urging the instructors in oral-intensive courses to emphasize the eight NCA competencies, encouraging instructors in oral-intensive courses to attend workshops that would discuss the eight competencies, and requiring more oral-intensive courses to submit videotapes for evaluation. Faculty at the Pearce Center are evaluating the use of a portfolio from major-related “Oral” courses as an assessment strategy.

Alumni opinion surveys (2000 *General Education Report*, p. 13) showed that most alumni were satisfied with their ability to speak before groups and with their confidence in public speaking situations. Table 4 provides the alumni survey data results. Echoing these results, 94.7% of alumni surveyed in 2001 reported that they were “very” or “somewhat” prepared to deal with

public speaking situations and only 5.3% of alumni thought that their program of study at Clemson had prepared them “little” or “not at all” for oral communication challenges.

**Table 4
Clemson Alumni Survey: Public Speaking, 2000**

How prepared were you:	% V or S	% L or N
To speak before groups and actively participate in group discussions (1-year alumni)	89	11
In the development of confidence/reduced apprehension in public-speaking situations (1-year alumni)	83	17
To speak before groups and actively participate in group discussions (3-year alumni)	90	10
In the development of confidence/reduced apprehension in public-speaking situations (3-year alumni)	81	19

V or S: “very” or “somewhat” prepared; L or N: “little” or “not at all” prepared

Mathematics. Mathematics competence is assessed primarily by the C-BASE, which tests General Mathematics (including practical applications, properties and notations, and statistics), Algebra, and Geometry. Clemson students normally do well on these assessments as noted in Table 5.

**Table 5
Clemson Juniors and Seniors
Mathematics Mean C-BASE Scores**

Sample=250 National mean=300	1998	1999	2000
General Mathematics	342	331	350
Algebra	317	308	325
Geometry	297	290	301
Mathematics Total	325	314	335

The committee was concerned that C-BASE assesses basic math skills that students should (and do) have when they arrive here, not math skills actually learned at Clemson. However, the committee charged with assessing General Education in science and mathematics does not rely on a single assessment strategy to evaluate the effectiveness of the General Education program at Clemson. The General Education committee concluded that C-BASE provides useful information, and there appears to be a good match between the competencies of General Education in mathematics and the skills that C-BASE measures (Memorandum Fennell to Reel, September 7, 2001).

Certain questions asked on the Alumni Survey also are relevant to the question of mathematical preparation of Clemson students (*Assessment of General Education, 2000-2001*, p. 35). In 2000, alumni from a broad selection of majors who had graduated the year before evaluated how well Clemson had prepared them for mathematical challenges in everyday life. The criterion for success of the relevant General Education committee was that 70% or more of the alumni (one year out) would agree with the statements in Table 6.

**Table 6
Clemson Alumni Survey: Mathematics, 2000**

Clemson contributed to my ability to:	V or S	L or N
Integrate mathematical reasoning concepts such as clarifying problems, formulating alternatives, developing appropriate tools, and analyzing consequences.	77%	23%
Think quantitatively and communicate basic mathematical/statistical concepts.	77%	23%
Apply mathematical concepts such as chance, rates of change, logic, and graphs.	74%	26%

V or S: “very much” or “somewhat”; L or N: “little” or “not at all”

Computer Use. While there is assessment of computer skills in specific Clemson Computer Science courses, the computer component of General Education assessment does not test any specific skills. The Computer Area Skills Subcommittee (of the Undergraduate Curriculum Committee) has concluded that it would be difficult to find specific computer skills that would be equally valuable or relevant in all majors. Assessment strategies (2000 *General Education Report*, p. 18) rely on a survey of instructors in writing-intensive courses on the degree of computer use by students, data on the number of students who use e-mail, and some items on the alumni survey. Specifically, the Computer Subcommittee expects that instructors in writing-intensive courses will report that 90% of their students use computers appropriately, and the Division of Computing and Information Technology (DCIT) should report that 95% of Clemson students use e-mail at least once per week. Unfortunately, for 1998 and 1999, only the alumni survey data were available, but other sources suggest pervasive use of e-mail at Clemson. The DCIT Web site (<http://dcit.clemson.edu/sig/email/Statistic.htm/>) discloses that from January 1 to April 5, 2000, Clemson faculty, staff and students downloaded 83 million e-mail messages. By the end of the Spring 2000 semester, two million e-mail messages per day were being downloaded at Clemson. Since 1997, Clemson e-mail usage has doubled every year. The DCIT Web site does not indicate how much of this e-mail activity is due to the students, but faculty experience suggests that Clemson students are heavy e-mail users.

Another line of evidence on computer use is the large number of courses at Clemson that use course management software such as WebCT and Clemson’s MyCLE to take online tests, receive and return student work, post grades, hold electronic discussions, etc. In Spring of 2001, 230 courses with 8,694 students enrolled were using WebCT. At the same time, 4,495 class sections with a total enrollment of 13,539 students were using MyCLE.

Perhaps alumni surveys are the best gauge of how well students feel Clemson prepared them to use computers. The Computer Area Skills Subcommittee does not use three-year-out alumni data here because General Education courses are likely to have little influence on computer use three years after graduation. Table 7 (*Assessment of General Education, 2000-2001*, p. 30) shows the 2000-01 response to these questions:

Table 7
Clemson Alumni Survey: Computer Use, 2000

Clemson contributed to my ability to:	% V or S	% L or N
Use basic computer skills (word processing, etc.)	94	6
Use technical computer skills (programming, Web applications, etc.)	72	28

V or S: “very much” or “somewhat”; L or N: “little” or “not at all”

Likewise, a survey in 2001 found that 90.1% of alumni thought that their education at Clemson had prepared them “somewhat,” “well,” or “very well” for using information technology. Although there is little in the way of direct assessment of student computer skills, alumni seem to agree that they had these skills when they graduated. Nevertheless, the data on computer use in writing-intensive courses and on e-mail use should be collected.

Two colleges have adopted laptop computer requirements for the fall of 2002. Freshmen and sophomores in the College of Engineering and Science and freshmen in the College of Business and Behavioral Science will be required to own laptop computers, and a third college, Architecture, Arts, and Humanities, will offer a voluntary laptop program in fall 2002. The advent of these requirements and programs will provide opportunities for the further development of assessment strategies related to computer skills.

2. Clemson University Assessment Committee

The General Education Subcommittee of the University Assessment Committee was charged with identifying opportunities available to Clemson students to achieve competency in General Education goals outside the classroom. The subcommittee examined student services and programs offered by various administrative units of the University in an effort to identify those that directly relate to General Education. In addition, a survey was sent to student organization presidents and to select club advisers to get their feedback on activities that address these competencies.

Clemson University provides a wide range of programs, services and activities for students to develop General Education competencies outside of class. While opportunities are offered campus-wide, many are provided through the Division of Student Affairs, which seeks to meet the unique needs of each student while encouraging all students to develop into

responsible adults and productive members of society. Student organizations also play a major role in the holistic development of students.

Examples of opportunities identified by the subcommittee:

- The Michelin Career Center assists students in career and internship planning, the job search, résumé preparation, and interview strategies (communication and speaking skills).
- The Division of Computing and Information Technology supports computing activities with an extensive network of computers and services such as electronic mail, word processing and spreadsheet software, Internet access, and student information services such as registration and financial aid (computer skills).
- The S.C. Botanical Garden, a 270-acre public garden, features several thousand varieties of ornamental plants, earth sculptures, cultural programs, nature demonstrations and volunteer/service learning opportunities (Physical or Biological Science).

In addition, there are more than 275 recognized student organizations on campus providing students with vehicles for self-improvement, a training ground for leadership skills, opportunities for social and philanthropic work, and as an agent for professional networking. Students find that the skills they gain through involvement in organizations play an important role in their life after college.

Component 2 Majors or Concentrations

Reporting on assessment in the major has been modified across the state to coincide with program reviews. Majors in the areas of forestry underwent program review by the South Carolina Commission on Higher Education (CHE) and Society of American Foresters since the last reporting period. Those programs included in the Interim Report are life sciences and English Language and Literature.

Synopsis of Program Review: Assessment for Selected Majors or Concentrations

Programs beginning with CIP codes 01, 02, and 03 are a part of the annual synopsis of program review. The 19 programs are all within the College of Agriculture, Forestry, and Life Science, many having approved options or concentrations. Unless otherwise noted, the information is contained in the annual assessment record for each degree of each program. Where possible, information is provided based on changes since the 1997-1998 review.

Agricultural and Applied Economics (<http://cherokee.agecon.clemson.edu/welcome9.htm>)

The department of Agriculture and Applied Economics offers degree programs leading to the Bachelor of Science and Master of Science in Agriculture and Applied Economics. The department, in a joint effort with the College of Business and Behavioral Science, also offers a Doctor of Philosophy degree program in Applied Economics.

The Bachelor of Science program in Agriculture and Applied Economics offers four concentration areas: agricultural business, economics, international trade and development, and real estate. The effectiveness of this program is measured through annual course evaluations, student exit interviews, student performance in capstone courses, and an alumni survey. Results gathered from these measures have been used to target courses needing re-evaluation (and to then re-evaluate these courses).

Agricultural and applied economics graduate programs at Clemson are solidly based on economic theory and quantitative methods. The student's course work and research may be focused in one of the following major areas: agricultural production economics, agricultural marketing economics, natural resource and environmental economics, and regional economics. The department offers two types of M.S. programs in agricultural and applied economics -- the thesis option and the non-thesis agribusiness option. The Ph.D. program is offered in cooperation with the Department of Economics. The program is administered by the Head of the Department of Agricultural and Applied Economics and the degree is granted in the College of Agriculture, Forestry and Life Sciences. The Program Administrator is advised by the Applied Economics Policy Committee, Applied Economics Curriculum Committee, and Applied Economics Comprehensive Examination Committee. Each committee consists of four members--two from each of the two departments. Emphasis is placed on empirical applications of economic theory to the analysis and solution of practical problems. The effectiveness of the graduate

programs is measured through monitoring of graduate job placement, rates of student publications, student performance on a comprehensive exam, and student enrollment and funding. Results from these measures have led to curriculum changes.

Agriculture and Biological Engineering (<http://virtual.clemson.edu/groups/agbioeng/pages/degrees/agmech.htm>)

The department of Agriculture and Biological Engineering offers a Bachelor of Science program in Agriculture Mechanization and Business. The agricultural mechanization and business curriculum consists of 135 semester hours of agricultural engineering technology, agricultural and basic sciences, and business management, in addition to the University's general education requirements. Students can tailor their program of study to meet individual career goals by specializing in an area of interest. Areas of specialization usually include production agriculture, technical sales and service, business and management, and government regulatory services. The effectiveness of this program is measured through exit interview surveys, employment rates in the field, and review by a departmental advisory committee. Results from these assessments are used to make program improvements.

Animal and Veterinary Sciences (<http://cufp.clemson.edu/avs/>)

The department of Animal and Veterinary Sciences offers degree programs leading to the Bachelor of Science in Animal and Veterinary Sciences, the Master of Science and Doctor of Philosophy in Animal Physiology, and the Master of Science in Animal and Food Industries.

The undergraduate curriculum provides students with a broad base of scientific principles and their application to livestock and poultry production, processing, and marketing. Five options are offered within the program: Dairy Business, Equine Business, Food Animal Business, Poultry Business, and Preveterinary and Science. The effectiveness of the Bachelor of Science program is assessed through student exit interviews, employment rates, alumni surveys, and student retention. Results from these measures have been used to make changes such as coordination of class materials to avoid overlap and increased encouragement of undergraduate research projects.

The Animal Physiology programs (M.S. and PhD) are interdepartmental graduate programs developed and offered by faculty in the departments of Animal and Veterinary Sciences, Aquaculture, Fisheries and Wildlife, Biological Sciences, and the Institute of Wildlife and Environmental Toxicology. The Animal and Food Industries program (M.S.) offers four concentrations: animal science, dairy science, food science, and poultry science. The effectiveness of the graduate programs is measured through research productivity and employment rates. Results from these assessments are used for program improvements.

Aquaculture, Fisheries and Wildlife (<http://virtual.clemson.edu/groups/AFW/index.htm>)

The department of Aquaculture, Fisheries, and Wildlife offers degree programs leading to the Bachelor of Science and Master of Science in Aquaculture, Fisheries, and Wildlife Biology and to the Doctor of Philosophy degree in Fisheries and Wildlife.

The undergraduate curriculum is strong in basic and applied sciences, communication skills and the social sciences. Students select an emphasis area in aquaculture and fisheries, wildlife management, or preveterinary medicine. The effectiveness of the Bachelor of Science program is assessed through: adherence to requirements for certification in professional societies (the American Fisheries Society and the Wildlife Society), adherence to graduate school prerequisite and entrance requirements, fulfillment of course requirements for employment in the field, percentage of graduates seeking advanced degrees, and improvement on a comprehensive exam administered to seniors (compared to performance their freshman year). Results from these assessments have been used to improve the fulfillment of requirements for certification in professional societies through newly developed courses (e.g., WFB 300 in the Fall of 2000 and 2001) and increased advising efforts. An additional botany course was added to the curriculum to improve fulfillment of course requirements for employment. To improve the percentage of students seeking advanced degrees, the department has added a one-day workshop for students considering a career in fisheries and wildlife.

The Master of Science degree offers concentrations in aquaculture, aquatic toxicology, conservation biology, upland and wetland wildlife biology, endangered species biology, wildlife toxicology, freshwater fisheries science and marine fisheries science. The Doctor of Philosophy degree offers three emphasis areas: fisheries biology, wildlife biology, and conservation biology. The graduate program in wildlife biology is accredited by the southeastern section of the Wildlife Society. Effectiveness of the graduate programs are assessed through: fulfillment of course certification requirements of professional

societies, student performance in courses, performance in thesis and dissertation defenses, performance on comprehensive exams, rates of publication in scholarly journals, timely completion of degrees, and data gathered from an alumni survey.

Crop and Soil Environmental Sciences (<http://agronomy.clemson.edu/>)

The department of Crop and Soil Environmental Sciences offers degree programs leading to the Master of Science and Doctor of Philosophy in Plant and Environmental Sciences. The effectiveness of these programs is measured through alumni surveys, quantity of scholarly papers and presentations by students, and exit interviews of graduates. Results from these assessments have been used to identify new courses needed, to explore the potential of distance education, to encourage increased rates of publication, and to improve communication between students and faculty.

Food Science and Human Nutrition (<http://www.clemson.edu/foodscience/>)

The department of Food Science and Human Nutrition offers degree programs leading to the Bachelor of Science in Food Science and to the Doctor of Philosophy in Food Technology. The Food Science program (B.S.) teaches students to apply principles of basic and applied sciences to the production, processing, evaluation, packaging, distribution, and utilization of safe, nutritious, and enjoyable foods and food products. There are two concentrations offered within the Food Science program: food science and technology, and nutrition and dietetics. The Nutrition and Dietetics concentration is currently granted approval status by the Commission on Accreditation for Dietetics Education of the American Dietetic Association. The effectiveness of the Food Science program is assessed through student focused discussion groups, student exit interviews, student performance on a professional exam, student surveys, and review of student portfolios. Results from these assessments have been discussed at a faculty retreat and strategies for improvement have been developed. The doctoral program in Food Technology is assessed through alumni surveys, student performance during dissertation defenses, and review of dissertation manuscripts. Results from these assessments are used to make adjustments in course offerings and research programs.

Forest Resources (<http://www.clemson.edu/for/degree.htm>)

The department of Forest Resources offers degree programs leading to the Bachelor of Science, Master of Science, Master of Forest Resources, and Doctor of Philosophy degrees. Current enrollments are about 180 undergraduate and 40 graduate students. From 1993 until the completion of the Self-Study in August 2002, the Forest Resource Management B. S. curriculum has undergone modifications. Recommendations for curriculum changes were based on data gathered from alumni surveys, reviews by the Department of Forest Resources Advisory Committee, and faculty initiatives. Changes made since the 1992 curriculum met the recommendations made by the Society of American Foresters Visiting Team in 1992. Overall, the semester hours required were reduced from 149 (9 in summer camp) to 136 (7 in summer camp). In addition, a course was added in the second semester of the senior year (Current Issues in Natural Resources); the program now provides 5 semester hours of course work specifically in policy and administration. The assessment of the graduate degree programs (MS, MFR, and PhD) has involved evaluation of final oral examinations, data gathered from alumni surveys, and rates of student publications in peer-reviewed journals. On the alumni survey, graduates are questioned on the strengths and weaknesses of their program and asked to evaluate the quality of the research program in terms of preparation for professional advancement. Curriculum changes and course improvements are based on these data and faculty initiatives.

Environmental and Natural Resources (<http://www.clemson.edu/enr/>)

The Environmental and Natural Resources program is a new program at Clemson. Three concentrations are offered within the Environmental and Natural Resources Bachelor of Science program: natural resource management, conservation biology, and natural resource and economic policy. The effectiveness of this program is measured through: a faculty panel review of the curriculum, review of assignments and tests in capstone courses, and student performance in cooperative projects. A faculty panel reviewed five top institutions for each concentration and found that greater than 80% of the courses offered in similar degree programs are being offered in each of the three concentrations. Through this review, they found that the natural resource and economic policy concentration is more rigorous in the sciences than most other degree programs, but lacks a course in Political Science required by most other programs. The natural resource and economic policy concentration is being reviewed to determine where best to add a course in Political Science. This course addition will then be submitted to the faculty for approval. This review process will continue with additional institutions.

Horticulture (<http://virtual.clemson.edu/groups/hort/NwTurfCur.htm>)

The Horticulture department offers a degree program leading to the Bachelor of Science in Turfgrass. The Turfgrass program has been tailored for individuals who are interested in careers in the rapidly growing turfgrass industry. This program offers

courses in turfgrass management, pathology of turf and ornamental plants, agricultural mechanization, personnel management, soil fertility, soil microbiology, weed control, and park and recreation management. The effectiveness of the Turfgrass program is assessed through alumni surveys, exit interviews, employer surveys, current student surveys, and internship participation rates. Results obtained from these measures have been used to increase the number of employer surveys conducted, to increase the use of service learning as an instruction method, and to recommend the requirement of internships for all turfgrass majors.

Packaging Science (<http://virtual.clemson.edu/groups/pkgsci/>)

The Packaging Science department offers degree programs leading to the Bachelor of Science and Master of Science. The Bachelor of Science degree in Packaging Science prepares students for careers in industries producing and utilizing packages for all types of products. Packaging is an essential part of industrialized economies, protecting, preserving, and helping to market products. Emphasis areas in the undergraduate program allow students to select courses to improve career preparation for specific industry segments; two emphasis areas are offered to students: food packaging and general packaging. The effectiveness of the undergraduate program is assessed through graduate employment rates, graduate surveys, success of graduates pursuing advanced degrees, student performance in capstone courses, and co-op performance evaluations (from employer). Results from these assessments have been used to make improvements to course content and to add a mandatory co-op to the curriculum. The Master of Science degree program in packaging science is designed to prepare the graduate to work independently in the research, development, and application of new packaging materials and processes. The effectiveness of the graduate program is measured through student performance on thesis defenses, graduate surveys, and review of thesis manuscripts. Results from these measures have been used to make adjustments in course offerings and research programs.

Interim Report

The programs in the interim report are not required to prepare a review for the South Carolina Commission on Higher Education (CHE) or professional accrediting agencies. The information presented in this summary is taken from the annual Assessment Records of the life sciences (CIP 26) and English Language and Literature programs (CIP 23).

Biological Sciences

The Biological Sciences department offers degree programs leading to the Bachelor of Science and Bachelor of Arts in Biological Sciences, the Bachelor of Science, Master of Science, and Doctor of Philosophy in Microbiology, and the Master of Science and Doctor of Philosophy in Zoology. The effectiveness of the Biological Sciences programs (BS and BA) is assessed through curriculum comparisons with comparable institutions, exit surveys, alumni surveys, and student performance in courses. Results from these assessments have been used to revise the curriculum. The effectiveness of the Bachelor of Science program in Microbiology is measured through student performance in courses, student exit interviews, and alumni surveys. Results from these measurements have been used to suggest curriculum changes, changes in course material, and to identify the need for new faculty members. The effectiveness of the graduate programs in Microbiology (MS and PhD) is measured through student performance on thesis defenses, rates of professional publications and presentations, and rates of employment in the field. Results from these assessments have led to increased encouragement of students to submit papers for presentation and publication. The effectiveness of the graduate programs in Zoology (MS and PhD) is assessed through exit interviews, rates of employment, alumni surveys, rates of publications and presentations, quality of student research and presentations, student performance on written theses/dissertations and defenses. Results from these assessments have been used to suggest program policy changes (e.g., requiring student publications prior to graduation).

English

The English department offers degree programs leading to the Bachelor of Arts and Master of Arts in English. The effectiveness of the Bachelor of Arts programs is measured through an annual review of anonymous student papers, student exit surveys, and alumni surveys. The effectiveness of the Master of Arts program is assessed through an annual review of seminar papers, student performance on a comprehensive oral exam, alumni surveys, surveys of first-year students, and student exit surveys. Results from these assessments are used to make program improvements.

Entomology

The Entomology department offers degree programs leading to the Master of Science and Doctor of Philosophy. The effectiveness of these programs is measured through student exit interviews, alumni surveys, student performance on

comprehensive exams, quality of written theses/dissertations and defenses, rates of student publication, quality of professional research presentations, and student participation in public service activities. Results from these assessments have been used to identify the need for a new faculty member with expertise in physiology, to identify the need for new courses (e.g., medical-veterinary course), and to increase emphasis on writing skills throughout the program.

Environmental Toxicology

The Environmental Toxicology department offers degree programs leading to the Master of Science and Doctor of Philosophy. The effectiveness of these programs is measured through the quality of written theses/dissertations and defenses, student performance on research projects, alumni surveys, employer surveys, rates of student submissions to refereed journals, rates of student publications, rates of professional presentations, and rates of employment. Results from these assessments have been used to revise the curriculum and to revise the graduate student handbook.

Genetics & Biochemistry

The Genetics & Biochemistry department offers degree programs leading to the Bachelor of Science, Master of Science, and Doctor of Philosophy in Biochemistry and to the Master of Science and Doctor of Philosophy in Genetics. The effectiveness of the Bachelor of Science in Biochemistry is measured through the relationships between performance in biochemistry courses and post-graduation placement and success, student performance on oral and written reports, student exit interviews, and relationships between performance in a senior seminar course and performance in related coursework (technical writing and public speaking). Results from these assessments have been used to recommend changes in the curriculum. The effectiveness of the graduate programs in Biochemistry (MS and PhD) is assessed through graduate employment rates, student performance on written theses/dissertations and defenses, student contributions to their research groups, quality of literature and research seminars given by students, rates of professional presentations, and rates of student publications. The department is currently developing a new curriculum for both the Master of Science and Doctor of Philosophy programs in Biochemistry. The effectiveness of the graduate programs in Genetics (MS and PhD) is assessed through student exit interviews, rates of professional presentations, student performance on written theses/dissertations and defenses, and rates of employment. Results obtained from these measures are being used to revise the curriculum.

Speech & Communication Studies

The Speech & Communication Studies department offers a Bachelor of Arts degree. The effectiveness of this program is assessed through measurement of critical thinking skills (using the Watson-Glaser Critical Thinking Appraisal), senior exit surveys, alumni surveys, outside review of student papers (random samples from an entry-level course and an exit-level course), senior performance on an objective-based human communication theory exam, and rates of employment. Results from these measures have been used to examine the delivery of human communication theory in the program.

New Data Requirement

In accordance with the new requirement regarding policies and procedures to provide a “technologically skilled workforce”, the following statement is provided. Clemson University’s mission statement reads, “... the goal is to develop students’ communication and critical-thinking skills, ethical judgment, global awareness, and scientific and technological knowledge.” Clemson provides an academic experience that fosters the on-going development and use of computer and technology skills. Computer skills are deemed essential for all students; as such, they are included as a general education competency area. In addition to course work that requires computer competency, students have other opportunities to develop and expand their computer skills such as using e-mail and registering for classes (on-line). Based on a pilot program, the College of Engineering and Science and the College of Business and Behavioral Science require laptops for freshmen students entering in Fall 2002. Other colleges are also considering voluntary and mandatory laptop requirements.

The Division of Computing and Information Technology (DCIT) supports the computing activities of students, faculty, and staff. DCIT maintains 13 computer laboratories, containing high-end PCs and laser printing equipment, across the campus. Computer training is available to all faculty, students, and employees as part of regular University courses, through short courses, and through special training programs. A complete list of services is available on the Web at <http://labs.clemson.edu>. DCIT also provides services through the Collaborative Learning Environment (CLE), which facilitates the use of technology in teaching and research by offering a wide selection of tools and resources. Access to the CLE services for each course section is automatically maintained through the class enrollment system. Additional information about the CLE is available on the Web at <http://cle.clemson.edu>.