DEPARTMENT OF BIOLOGICAL SCIENCES
DELTA STATE UNIVERSITY

Summarization of:
UNIT VISION FOR THE FUTURE
MAJOR UNIT GOALS FOR 2000-2001
INSTITUTIONAL GOALS SPECIFICALLY ADDRESSED
RECOMMENDATIONS AND REQUESTS

to accompany
ANNUAL REPORT FOR THE CALENDAR YEAR 1999

and

BUDGET REQUEST FY 2001

submitted by:

Grady E. Williams III, Ph.D.
Chair and Professor
Unit Administrator

April 11, 2000
UNIT VISION FOR THE FUTURE

Mission Statement

The mission of the Department of Biological Sciences is to provide instruction in biology, environmental science, and biology education in a manner that will help develop biologically literate, educated professionals. We especially seek to develop the technical competence and broad intellectual foundation needed to understand the implications of human influence on all of life and to make informed decisions on biological and ecological questions. The Department also endeavors to meet the general educational needs of the University; to contribute new knowledge in biology, environmental science, and biology education; and to serve the needs of educators, other professionals, and communities within the service area.

Vision Statement

We aspire to be known throughout the region, state, and beyond as a center of excellence in undergraduate biology education. It is our goal to improve to the point that we are held as the standard against which other schools benchmark their programs. To achieve this, we will promote the philosophy that highly technical and dynamic programs in the biological sciences must have priority support status and we will focus our creativity, energy, and resources to achieving that end. We must develop and maintain technologically-current, pedagogically-current, content-current and sophisticated curricula geared to meet the changing demands of our constituents. Our recent and on-going revision of the biology, pre-health, and environmental science programs to incorporate new demands in those fields are testimony to our resolve to provide up-to-date educational opportunities. Likewise, we desire to expand and enhance our science education program through realization of the Center for Science and Environmental Education (CSEE) so that it is known as the premier program in the state and region, both for its excellent degree programs and for its formative impact and service in leading and supporting revolutionary development of strong K-12 science education programs in school systems throughout the Delta region. And last, we plan to increase emphasis on research activities that will benefit undergraduates, graduates, and faculty from educational and professional development perspectives.

We envision the department building upon its role as a campus leader in developing and enhancing the university goal of strengthening community outreach. Continuing education and other post-graduate educational opportunities will be expanded in response to interests and needs expressed by the community. Two major avenues for achieving this part of our vision are (1) the development of a campus arboretum, gardens, museum, and associated programs for the campus community, school groups, and the lay public and (2) development of the CSEE outreach programs for the general public as have been previously proposed.

Finally, we see that external funding will be a much more important component of our resource base in the future. We will aggressively increase our efforts in development activities and, with university support, we will increase grant-writing to support the department’s programs and demands for resources. We will work toward greatly expanding our endowment to assist in ensuring an adequate and sustainable resource base for our future.
Continued Goals from 1999-2000

1. The department will provide adequate space, equipment, and resources so that students have the opportunity to develop research and technological skills required to succeed in their future employment or professional or graduate training. The department will have a strong commitment to attract high quality students by maintaining facilities that keep pace with current developments in technology.

2. Students will work with “cutting edge” middle school and high school textbooks, multi-media resources, and supplementary curriculum materials, e.g., science, technology, and society materials, during their course work in the biology education degree program.

3. The department will initiate curriculum revision to update our program offerings and reflect strategic development of specialized tracks within the BS in Environmental Science major (conservation biology and water quality/management) and within the BS in Biology major (industrial biology, plant sciences and technology, and health professions).

New Goals for 2000-2001

4. The department will define a process to annually examine, modify, and/or redefine its mission and unit goals relative to university goals.

5. The department will initiate a departmental-wide review of its curriculum and pedagogy.

6. The department will upgrade its efforts and abilities in the area of cell biology and biotechnology through curriculum revision, dedication of resources, and strengthened collaboration with the Department of Physical Sciences.

7. The department plans to develop a campus arboretum for teaching functions and for utilization in campus and community outreach functions.

8. The department plans development of a functional Center for Science and Environmental Education (CSEE) to meet the resource, professional development, and other educational support needs of Delta school districts, science teachers, and their students; to provide for continuing science education experiences for the broader community; and to provide experiential learning activities for our departmental science education majors.
INSTITUTIONAL GOALS SPECIFICALLY ADDRESSED*

From 1999-2000 University Bulletin:

(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.

(5) Accommodate non-traditional students and the general public by offering a comprehensive program of continuing education, including off-campus classes, independent study courses, non-credit courses, conferences, and workshops.

(6) Optimize the effective use of technology in support of the education process.

(8) Enhance educational experiences at all levels by encouraging student and faculty research and other creative work.

From 2000-2001 University Goals Statement:

(E) Improve the use of instructional technologies.

(H) Refine and coordinate more effectively community and economic development activities.

(I) Support interdisciplinary centers that contribute to our regional mission.

(J) Beautify the campus.

(L) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.

(O) Strengthen experiential learning activities

(Q) Pursue federal and private funding.

(R) Seek ways to enhance student life on campus.

*Unit goal #4 involves examination of the department's role in meeting all institutional goals as stated in the 1999-2000 DSU Bulletin and in the Statement of University Goals for 2000-2001. This unit goal thus has the potential to support most, if not all, university goals including those not specifically identified above.
RECOMMENDATIONS AND REQUESTS

The department offers the following recommendations and requests:

1. Support the department in its goal to become truly excellent and the standard against which other university biology departments are measured.

2. Adopt the philosophy that highly technical and dynamic programs in the biological sciences must receive priority support status to assure that program demands are met and maintained.

3. Mount an aggressive alumni/foundation campaign drive with specific focus and commitment to fund/endow the many needs of the Department of Biological Sciences (one in which there are no competing campaign interests) and develop a support partnership with business and industry.

4. Expand the departmental budget to assure adequate laboratory instructional equipment, field experiences, and other program needs and resources.

5. Provide mechanisms to secure funding that will secure, maintain, and replace equipment, technology, and other programmatic needs on an "as necessary" basis.

6. Provide funding and mechanisms above the departmental budget to support departmental activities in alumni/foundation and recruiting efforts.

7. Create "new" instructional space to adequately and appropriately house the department.

8. Build a north campus facility to accommodate the department's field-oriented programs.

9. Provide up-to-date classroom instructional technology.

10. Provide computing and GIS/GPS technology laboratories.

11. Create and officially designate the CSEE as the science education outreach function of the university for the benefit of Delta science teachers, their schools, and their students.

12. Upgrade the department's present faculty position in science education to a 12-month coordinator position to provide availability that matches the summer demands of inservice science educators.

13. Create a new (second) faculty position in science education to share the burden of administering the two departmental science education programs and to support CSEE efforts.

14. Support the department in development of a larger research focus to provide for individual faculty scholarly activity and support of undergraduate and graduate programs.

15. Provide the necessary paradigm adjustment relative to philosophical and operational modes that will stimulate desirable growth in the graduate program.

16. Develop an effective grants office led by competent personnel who are dedicated to facilitating the department's grant-writing function and managing its projects.
DELTA STATE UNIVERSITY: ANNUAL REPORT
for the Calendar Year 1999
and Budget Request FY 2001

College of Arts and Sciences

I. Unit Title: Biological Sciences   Unit Administrator: Grady E. Williams III

II. Data and Information for Department

Credit Hour Production

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Enrollment by Major

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Faculty Advising Load

Average faculty advisee load for Fall 99 = 29
Range of faculty advisee loads for Fall 99 = 10 to 37 students per faculty member

External Funding and Grant Activity

Established the “Biological Sciences Fund” for solicitation in support of program enhancement. $12,025 received in gifts and pledges to date.
ChemFirst, Inc. grant of $5000 for purchase of biotechnology equipment. Joint effort with Department of Physical Sciences.

$10-12 million joint proposal through USFWS to establish facility and program funding for CSEE at Dahomey National Wildlife Refuge. (Pending)

Follow-up of Graduates

Total graduates May 1999 = 59
Placement related to degree = at least 50 of 59 or 85%; 5 are “unknown”

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Other Information Demonstrating Growth and Departmental Characteristics

The APPENDIX contains an assessment report entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University. The report includes data relative to long-term (21- and 28-year periods) historical growth and productivity trends as evidenced by number of majors, undergraduate and graduate credit-hour production, and relative percent of upper level/graduate credit-hour production. Data are also presented on available unit instructional space, instructional room assignments, and numbers of lecture and laboratory sections scheduled.
III. Personnel

Noteworthy activities and accomplishments

Dr. Nina Baghai Riding is a first-year faculty member who occupies a new position in the environmental science program. She has devoted most of her time to effective teaching and course development. She revised the Introduction to Environmental Science course and has added new courses in Physical Geology for Life Sciences and Environmental Geology in support of departmental revision of the Environmental Science major. She served on the revision committee for that major and is a member of the Undergraduate Programs Committee. She has participated in recruitment functions and in organizing guest speakers in the department. Dr. Baghai Riding was active in writing book reviews, preparing poster sessions, preparing and submitting manuscripts, and in writing research grant proposals in her area of speciality. She received a faculty research grant, developed professional relationships with scientists at USDA-ARS at Stoneville, and is collaborating with scientists at other universities on research efforts. Dr. Baghai Riding made initial efforts to establish facilities and necessary laboratory equipment to incorporate departmental students into her scholarly pursuits. She has added significant strength to the department and is working to establish strong collegial relationships with other faculty and is becoming popular with the students. Her expertise will prove to be valuable to our community outreach initiatives in the area of museum and science education activities.

Dr. Barry Campbell is a first-year faculty member who occupies the subdiscipline areas vacated via Dr. Wayne Walley’s retirement. Dr. Campbell is an expert parasitologist who has extensively revised departmental offerings in Parasitology and Histology. He has revived our course in Medical Entomology. He designed courses to fit existing needs while adding breadth to our offerings. His history of outreach, extra-institutional service, and willingness to offer new or modify traditional course work to address regional concerns is an asset to the department. Dr. Campbell is a scholarly instructor who while challenging students, exhibits empathy and concern for their difficulties. He is becoming known and respected for his depth of knowledge, energy, commitment, and interest in and fairness to students. Since beginning at DSU, he has contributed to an international data base in Great Britain, the development of a CD-ROM for the National Wildlife Rehabilitator’s Association, an internet-based book revision for the International Veterinary Information Service, and served as a reviewer for three professional journals. He presented seminars at University of Tennesse - Memphis, University of Wisconsin, and Tulane. Dr. Campbell has involved himself with departmental student and development activities by serving as a member of the Curriculum Committee, participating in the Biology Club, making efforts to secure internships for MAMP students, securing guest speakers, providing quality advisement and mentoring functions, and developing strong collegial relationships with other faculty. He has developed an outreach advisory function to the local community by serving as an expert parasitology resource to lay persons, health-care professionals, and catfish producers. He also assisted professionals and academic scientists at various institutions in the USA and internationally in four additional countries.

Dr. Samuel Faulkner’s strong laboratory and experimental skills represent strategic contributions to our departmental abilities and hands-on pedagogical emphasis. He was active in leading graduate students in research projects and submitted several papers for publication or presentation. He proposed and conceptually developed or taught seven
new upper level undergraduate and graduate level courses to strengthen our environmental science curriculum and defined the plant science-technology track that will satisfy the needs of students with agricultural interests. He was instrumental in securing highly qualified professional adjuncts to add professional perspectives to these two programs. He brought several professionals to the campus for seminar presentations. Dr. Faulkner secured the 2001 meeting of the “Southeastern Division of the Society of Wetland Scientists” for the DSU campus. His activity and interest in developing the natural history museum, campus gardens, and an arboretum as educational and outreach functions of the department and university continued. He is editor of the departmental newsletter “BioNotes”. He serves on the departmental Graduate Programs, Renovations, and Computing and Instructional Technology Committees.

Dr. William Hayes developed new courses in research Design and Analysis and Aquatic Entomology that serve our graduate program needs. He contributed an Honors section of BIO 100 to that university initiative. He maintained an active research program, directed or served on the advisory committees of several graduate students, and chaired the Graduate Programs Committee. He was involved in conducting workshops, presenting at conferences, and in preparing professional publications. Dr. Hayes continued to be a departmental and campus leader in critical thinking methodologies in the classroom. He served as president for the Southern Regional Faculty and Instructional Development Consortium and continues to be a force in faculty development initiatives on campus. He developed “The Grove” on-line resource for faculty development, offered campus-wide workshops in “Blackboard.com” and has continued as a leader in campus development of internet use in instruction. Dr. Hayes served as a reviewer for the Journal of Excellence in College Teaching and contributed to development of “Biology CD-ROM” by Archipelago Productions. He co-chaired the task force for technology in the university-wide strategic planning process.

Dr. Keith Hughes, in his second year at Delta State University, has become a popular instructor and proved a valuable departmental asset. He is a diligent, engaging, and innovative student-oriented teacher and faculty colleague. He has redesigned and modernized microbiology and biotechnology offerings and has developed an industrial microbiology course which will serve as a focal point for the developing "industrial biology tract". With his leadership and expertise, this program will expand our capabilities in preparing students for positions in industry involving quality control/quality assurance procedures. Dr. Hughes serves as faculty senate representative, member of the University Benefits Committee, chair of the departmental Renovations Committee, and as a member of the departmental Undergraduate Program Committee. He published one scholarly paper, received a university research grant for direction of undergraduate research, and a faculty development award to attend the ASM national conference on teaching innovations for undergraduate microbiology. He has taken initiative to become an active advisor of the Biology Club.

Dr. Malcolm McEwen continued updating his science education courses with the latest developments in technology and innovative hands-on activities and developed a new course in “College Biology Teaching”. He spear-headed development of a collaborative biology teaching internship program with Mississippi Delta Community College. He serves a masterful and critical lead role by providing in-service training to delta area science teachers and through his advisory affiliation with the Delta Science Teachers Association. He organized and hosted the annual meeting of the DSTA on the
DSU campus. Dr. McEwen served as immediate past-president and membership director for the Mississippi Science Teachers Assn., chaired the Scientific Review Committee for the Mississippi Region 3 Science and Engineering Fair, and served as state director of the Outstanding Biology Teacher Award program of the National Assn. of Biology Teachers. He served the department as the sole advisor for Option A - MSNS graduate students and BSE in Biology Education undergraduates. Dr. McEwen received a faculty research grant to investigate science and environmental education needs in the Delta. He worked diligently with the USFWS to jointly propose development of the Center for Science and Environmental Education. He served on the Departmental Executive Committee, the Graduate Program Committee, and chaired several graduate student committees, the departmental Curriculum Committee, and the Mission and Goals Committee. He is a major force in the department’s initiative to redefine its curriculum, pedagogy, and assessment procedures to bring better alignment with national benchmarks and standards for excellence in science education.

Mr. Michael Smith provided talented leadership for the MAMP program as its director. He was active and successful in recruiting talented minority students for the university science and math programs and served as liaison to high schools, graduate schools, and professional schools.

Dr. Robert Stewart continued to expand the DSU herbarium which now contains 11,500 specimens. He continued to serve on the board of the Institute for Botanical Exploration and served a community outreach function as chair of the City of Cleveland Tree Board. He served the department on the Executive Advisory, Mission and Goals, Graduate Programs, and Renovations Committees, and served on several graduate student committees. Dr. Stewart co-authored a technical presentation with Dr. Faulkner, with whom he also collaborated to bring several seminar speakers to the campus. He was also a collaborator on departmental activities relative to the arboretum initiative. He has announced intent to retire effective May 2001. His participation, wisdom, and perspective will be missed.

Dr. John Tiftickjian is a valued asset in terms of both his teaching effectiveness and his logistical support to the department. He has continued to expand his masterful use of technological innovations in his courses and is a popular instructor and mentor. He made extensive use of the internet in his courses and continued to develop his web-based approach. He has been instrumental as chair of the departmental Undergraduate Program Committee, chair of the Computing and Instructional Technology Committee and has continued to maintain a large data base on our undergraduate majors and alumni. He continued to be active with the Faculty Senate, and served on the Academic Computing Committee and the ITS Advisory Committee. Dr. Tiftickjian serves the campus community as the unofficial Macintosh expert and operates the DSU Macintosh Users Group, providing his advice and expertise to all MAC users on campus. He maintains the departmental web site.

Ms. Shawn Walker, in her second year at DSU, continued upgrading and modernizing our laboratory holdings and instruction in Human Anatomy and Physiology through the utilization of internet resources and interactive media. She received a faculty development grant to participate in an interactive media workshop for instruction in A&P. She has assumed a major role in advising pre-health profession students and in strengthening liaison with health-professions schools. She has become a favorite among students because of her hard work and caring attitude. She organized
students who raised over $3000 in the American Heart Association’s Walk for Awareness. Ms. Walker initiated an advanced study program which included entrance into a Ph.D. program in Biology at the University of Tennessee - Memphis. She has crafted a research program that incorporates interinstitutional collaboration between the Department of Biological Sciences at DSU and the Department of Biology at UT-M and will provide research opportunities for undergraduate and graduate students from DSU. She serves the department on the Undergraduate Programs and Renovations Committees and is the new advisor of BBB.

Dr. Ed Williams assumed the position of Chair of the Department of Biological Sciences on July 1 after serving as Chair-elect during the spring semester. He participated in several faculty development workshops to develop his leadership skills including the CCAS Conference for Academic Chairs. Organizers of that conference recruited him as a facilitator for the March 2000 workshop. He continued his strong service role to the university and departmental students. He chaired the Elliott Program of Excellence Committee while also serving as faculty advisor to PEP, AED, and BBB. He served on the WPE Appeals Committee and on several graduate student theses committees. Dr. Williams developed and taught new courses in Vertebrate Ecomorphology and MCAT Preparation to support the department's internal revision and expansion of its programs. He prepared a popular article for “Delta Wildlife” magazine as a community outreach function. He served as Chief Pre-Health Academic Advisor for NAAHP/SAAHP and liaison for AAMC, AMCAS, and ACOMAS. He received a faculty development grant to attend the national meeting and training sessions of the SAAHP. He served the university as a member of the DSU Presidential Search Local Advisory Committee. Dr. Williams has fostered and supported departmental initiatives relative to facility renovation, curriculum and pedagogical revision, development of the CSEE, development of a campus arboretum, external fund-raising, and community outreach.

New positions requested with justification

A second faculty position is needed in the Biology Education program. This faculty position is needed to alleviate the enormous and over-burdened work load of Dr. Malcolm McEwen in administering the B.S.E. in Biological Sciences major and the M.S.N.S. Option A graduate program in education. This position will facilitate much needed curriculum expansion, in-service science teacher professional development functions, and school support functions of the science education program at DSU. This position will address pressing needs and will permit initiation of activity required to support the initiative to bring the Center for Science and Environmental Education (CSEE) into fruition and provide for its early foundation and support. Many of these functions are currently precluded or significantly limited due to lack of sufficient science education personnel. Current work load demands and community demands needing to be embraced exceed Dr. McEwen’s capacity.

Recommended change of status

Dr. Barry Campbell is eligible for promotion to Associate Professor of Biological Sciences. This promotion is recommended and supported by his previous record and his excellent service to this department, DSU, and its students during the current academic session.
Dr. Samuel Faulkner is completing his seven-year probationary period and is eligible for tenure. He also completes his third year in rank as Assistant Professor. He is therefore eligible for granting of tenure and for promotion to Professor of Biology and Environmental Sciences. Award of tenure and promotion is recommended and supported by his dedicated and talented service to this department, to DSU, and its students during his seven years of service.

Dr. Malcolm McEwen's current 9-month faculty position needs to be upgraded to a 12-month faculty/director or coordinator of science education position. This change of status will assure a dependable and sustainable base at DSU allowing us to develop much needed summer programs that appropriately meet educational and professional development demands of inservice science educators and school districts. They need DSU to provide meaningful, quality science education support workshops, continuing education programs, student science camps, and academic offerings on a dependable basis during the summer rather than on a piece-meal, hit-or-miss basis. This position upgrade along with the new position requested above will provide Dr. McEwen with the release time and opportunity to redirect his talents to requisite organizational and grant-writing efforts that will facilitate development of a quality science education program at DSU. We must act to meet the existing unmet demands of the regional science education community as well as the current function of training new science educators. This position is viewed as necessary to implement envisioned programs of the CSEE which will incorporate extensive summer programs as well as school-term programs. A more complete discussion of the problems and opportunities associated with this request is presented beginning on page 12 in the appended assessment report entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University.

IV. Degree Program Addition/Deletions and/or Major Curriculum Changes

The BS in Environmental Science curriculum was revised to reflect expressed needs by our graduates and their employers as well as position announcements for environmental scientists. This revision included development of several new courses and redesign of others to give more current and detailed coverage of concepts and skills in keeping with the changing nature and demands of the discipline.

The BS in Biology remained unchanged, however, effort was initiated to tailor several specialized tracks within the degree. Work was completed on a defined "Premedical" track. The department initiated development of "Industrial Biology" and "Plant Science and Technology" tracks but these remain under consideration to be completed during the next academic year. Definition of these tracks will visualize and advertise such vocational and educational opportunities for prospective students and provide vehicles to bring together and deliver the specialized academic and technological training required by these disciplines. This effort has involved revision of existing courses and creation and/or planning of new courses and experiences to improve alignment of our curriculum with demands of our consumers.

The MSNS options A and B were revised to accommodate course revisions, additions/deletions, and to make them more appropriate.
V. Assessment of 1999-2000 Unit Goals

A. Unit Goal #1: (1999-2000)

We continue to seek to employ a qualified professional environmental scientist with comprehensive and diverse training to oversee and direct necessary change in the focus of the Environmental Science program. Modifications will to be made to make the major more interdisciplinary and comprehensive, including participation from other departments, and development/revision of courses to meet specific skills and demands required by a changing job market. Additionally, these changes could include development of an interdisciplinary Environmental Science minor and/or a general education component for non-departmental majors.

B. Institutional Goal Supported by Unit Goal:

(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.
(2) Attract and retain qualified and diverse students, faculty, and staff.

C. Assessment Procedure:

The creation and filling of the position, development of new course offerings within the department, and revision of the major was documented through employment records and catalog copy. Interaction with the Department of Physical Sciences relative to their support of this major led to course changes that are documented in catalog copy. We compared the curriculum with job market requirements expressed widely in trade journal, professional journal, and job service announcements and by our graduates in the major and their employers.

D. Expected Results:

We expect this professor to provide the leadership that will remove the static state of the Environmental Science program by developing necessary and appropriate coursework, true interdisciplinary involvement across campus, expanded opportunities for student employment, internship, research, and public service experiences. We expect to have a program that more closely matches the job market requirements for majors and provides educational opportunities for non-majors from across campus who desire inclusion of environmental awareness in their general education component.

E. Actual Results of Evaluation:

Dr. Nina Baghai Riding was employed to occupy this position. She adequately met the diversity of background desired to develop a more interdisciplinary and comprehensive program. The concept of an environmental science minor was not realized. It is likely that this is a concept ahead of its time on the DSU campus. At present, environmental science is being incorporated into the general education experience in the form of components in general biology courses and perhaps through other disciplines.
F. Use of Assessment Results for Program Improvement:

Dr. Baghai Riding and existing departmental environmental scientists and faculty from the Department of Physical Sciences collaborated to refine the curriculum and develop new courses and experiences for the major. A program is now in place that is more accurately aligned with employment opportunities and addresses many of the issues where it was previously inadequate. Those discussions have generated an interest in the Department of Physical Sciences that may lead to development of a related program in environmental chemistry. The case has been made to consider environmental science for broader inclusion in the general education experience when it is evaluated in the future.

A. Unit Goal #2: (1999-2000)

The department will provide adequate space, equipment, and resources so that students may have the opportunity to develop the research and technological skills they will require to succeed in their future employment or professional or graduate training. The department should have a strong commitment to attract high quality students by maintaining facilities that keep pace with current developments in technology.

B. Institutional Goal Supported by Unit Goal:

(2) Attract and retain qualified and diverse students, faculty, and staff.
(11) Provide the resources, facilities and the physical environment which contribute to the intellectual, cultural, ethical, physical, and social growth and development of the student and of the surrounding community.

C. Assessment Procedure:

An evaluation of the adequacy and utilization of all classrooms, laboratories, and equipment was carried out by departmental mission, curriculum, renovation, and instructional technology committees. The assessment was used as a basis to ensure that existing resources are being used efficiently and to propose upgrading of current facilities and equipment. Input from faculty through committees formed to evaluate departmental mission, curriculum, facilities, and computing and instructional technology was gathered regarding needs for specific course and broader program development that will assure competitive programs capable of attracting high quality students. Records of committees actions are present in departmental files and were used in producing a more inclusive assessment report to the department and administration entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University.

D. Expected Results

The instructional and research facilities housed in Caylor Hall will be modernized, out-of-date equipment will be replaced, and additional space will be sought to provide students with an environment that exposes them to the latest in scientific instrumentation and computing facilities for learning skills they will need in their future careers. Proposed renovations include: (1) Replacing aging microscopes in the general botany laboratory, (2) purchase of specimen preparation equipment needed to make the
existing scanning electron microscope (SEM) fully functional, (3) converting the former photographic darkrooms into student research facilities, (4) upgrading the science museum located in Caylor Hall, (5) modernizing instrumentation for ecology and plant physiology laboratories, (6) providing adequate computer facilities in a local computer lab to facilitate integration of that technology into classroom and laboratory experiences.

E. Actual Results of Evaluation:

Upon evaluating the department’s facilities and equipment, it is clear that little progress was made relative to achieving measurable progress towards this goal. The instructional and research facilities housed in Caylor Hall still need significant modernization to facilitate incorporation of current instructional technology, instrumentation, and evolving pedagogies. Out-of-date equipment must be replaced and additional space must be provided to assure our students an appropriate modern environment, programs, and facilities that expose them to the latest in scientific instrumentation and computing facilities for learning the skills required for their future careers.

Proposed renovations included: (1) Replacing aging microscopes in the general botany laboratory, (2) purchase of specimen preparation equipment needed to make the existing scanning electron microscope (SEM) fully functional, (3) converting the former photographic darkrooms into student research facilities, (4) upgrading the science museum located in Caylor Hall, (5) modernizing instrumentation for ecology and plant physiology laboratories, (6) providing adequate computer facilities in a local computer lab to facilitate integration of that technology into classroom and laboratory experiences.

Few of the above requests were met. However, funding was made available at close of the 1998-1999 budget year to purchase five microscopes for the botany laboratory (20 were needed), to purchase a scanning spectrophotometer for ecology and plant physiology laboratories, and a human anatomical model to upgrade 3-D instructional resources in the anatomy and physiology laboratory.

F. Use of Assessment Results for Program Improvement:

While the department acknowledges the reality of funding shortages, the university must find a way to support the improvement and maintenance of our capabilities. It is an axiom of today’s rapidly changing technological world that significant discipline-related expense will be incurred to upgrade and maintain science facilities at an acceptable competitive level and thereby attract top-quality students and offer them valid educational experiences.

The department responded to the call for a case statement by the Alumni Foundation addressing its needs and desired initiatives for which the development office might seek outside funding in the new 75th Anniversary Campaign for Delta State. We offered an extensive response based on the results of our assessment relative to this unit goal. Subsequently, Dr. Ed Williams submitted a more inclusive assessment report to the department and administration entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University. This report is appended to this annual report and budget request.
A. Unit Goal # 3: (1999-2000)

Students will work with “cutting edge” middle school and high school textbooks, multi-media resources, and supplementary curriculum materials, e.g., science, technology, and society materials, during their course work in the biology education degree program.

B. Institutional Goal Supported by Unit Goal:

(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.

(6) Optimize the effective use of technology in support of the education process.

C. Assessment Procedure:

Analysis of the department budget and other records of purchases by the College of Education and records of inventoried equipment transfer.

D. Expected Results:

Recent textbooks and other curriculum materials for use by preservice science teachers will be obtained. Adequate funding is absolutely critical to attainment of this goal. Funding requested in the Departmental budget for the last several years to begin movement toward attainment of this goal was not forthcoming. To continue to meet NCATE standards for our biology education program it is necessary that we address this issue immediately. The longer we delay in addressing this issue the greater jeopardy our program faces. Use of materials procured with these funds will be infused into projects required of students enrolled in the following courses offered by the department: CUR 493, “Teaching the Sciences”; BIO 334, “Investigating the Natural World”; BIO 435/535, “Methods and Materials in the Biological Sciences; BIO 601,” Problems in Teaching Biology in the Secondary School.”

E. Actual Results of Evaluation:

This unit goal was met with 100% success. A departmental commodity increase was used to purchase requested materials. We additionally received donations of educational software from publishers. Several older version 486 computers from the IRC were reassigned to the department when that unit moved to the library. The College of Education provided some grant monies to acquire an internet hub in the science education room and provided for some instructional technology for use in science education courses.

F. Use of Assessment Results for Program Improvement:

Materials procured with these funds were infused into projects required of students enrolled in the following courses offered by the department: CUR 493, “Teaching the Sciences”; BIO 334, “Investigating the Natural World”; BIO 435/535, “Methods and
Materials in the Biological Sciences;” BIO 601, “Problems in Teaching Biology in the Secondary School.” Shortages still remain and laboratory equipment is insufficient.

Since funds for such critical materials have been requested but not provided for in the departmental budget during four of the last five years, we still need additional funding to acquire more science education resources. We need to continue this goal for the next budget year and will request consideration for financial assistance to purchase laboratory equipment for the purpose of meeting this goal.

A. Unit Goal # 4: (1999-2000)

The department will initiate curriculum revision to update our program offerings and reflect strategic development of specialized tracks within the BS in Environmental Science major (conservation biology and water quality/management) and within the BS in Biology major (industrial biology, plant sciences and technology, and health professions).

B. Institutional Goal Supported by Unit Goal:

(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.

C. Assessment Procedure:

Examination of catalog copy and in-house materials to include suggested plans of study will verify creation and changes in programs. We will monitor the number of students following each track and their success in completing academic requirements. Student performance in academic course work will give a measure of mastery of skill and knowledge. Acceptance rates into related employment areas, graduate programs, and professional schools will be a measure of program appropriateness and student success.

D. Expected Results:

We expect more of our majors to associate with clearly defined tracts early in their careers and develop prerequisite professional skills, attitudes, and knowledge earlier than before. This should lead to better student awareness and mastery of skills and knowledge necessary to successfully advance in their careers. It will also provide more visibility for departmental programs, provide necessary in-house focus on specific program needs, and allow us to be more responsive in recognizing and providing needed changes to accommodate marketplace demands on our graduates.

E. Actual Results of Evaluation:

This goal is in its initial phase. While much preplanning has been conducted, the achievement of this goal is complex and involves course revision, hiring of new and/or replacement faculty, and possible reassignment of faculty roles. A revised environmental science major and a premedical track within the biology major have been achieved and will appear in the 2000-2001 university bulletin. Industrial biology and
plant sciences and technology tracks within the biology major have been drafted but not approved. Those tracts will be completed for inclusion in the 2001-2002 bulletin. Several courses have been revised or created to facilitate the creation of these new tracks and the revised environmental science major. Planning relative to this goal is proceeding.

F. Use of Assessment Results for Program Improvement:

It is too soon to measure results of these revisions in departmental programs. This goal will need to be followed for several years to see the impact of these changes. We expect more of our majors to associate with clearly defined tracts early in their careers and develop prerequisite professional skills, attitudes, and knowledge earlier than before. This should lead to better student awareness and mastery of skills and knowledge necessary to successfully advance in their careers. It will also provide more visibility for departmental programs, provide necessary in-house focus on specific program needs, and allow us to be more responsive in recognizing and providing needed changes to accommodate discipline-related marketplace demands on our graduates.

VI. Student Outcomes: (1999-2000)

Degrees: Majors

BS: Biology
BS: Environmental Science
BSE: Biology Education
MSNS: Biological Sciences

A. Student Outcome # 1: (1999-2000)

Students will acquire a broad knowledge of the fundamental principles, concepts, and skills attendant to biological literacy. They will be able to make connections between concepts and demonstrate higher order thinking skills (application of skills and concepts in creative and critical thinking, problem solving, data analysis, etc.). This student outcome applies to each degree program in the department with appropriate emphasis assigned to discipline specific areas of uniqueness.

B. Assessment Procedure:

Acceptable performance in course work and progression through the respective major sequence will testify to acquisition of requisite biological literacy and performance ability. A portfolio of example work will be created for each student. Materials included in the portfolio will be used to examine the student's proficiency in key areas of biological science to include writing, data analysis, and evidence of knowledge of fundamental principles and concepts. Graduating students will take a departmental senior exit exam administered during their final semester. The senior exit exam is given near the end of each semester to graduating seniors. Test items have been constructed by all faculty to represent a cross-section of the basic knowledge needed by students completing a major in the department. Test results are summarized by subject area to determine specific strengths and weaknesses. We have studied the possibility of combining this "in house" test with a nationally normed test.
C. Expected Results:

The portfolio of acceptable example work created for each student will demonstrate the student’s proficiency in key areas of biological science. Graduating students will achieve acceptable scores on the departmental senior exit exam administered during their final semester.

D. Actual Results of Evaluation:

From examination (summer 1999) of portfolios and past senior exams (December 1998 and May 1999), some problems are clear. Recent graduates taking the test did not seem well-grounded in plant and animal diversity, animal anatomy and physiology, and evolution, but did well in ecology and principles of systematics. Many students seem to depend on rote memory rather than developing a working knowledge and proficiency of skills. We are maintaining student portfolios but are not certain of their validity in student evaluation or in program evaluation.

E. Use of Assessment Results for Program Improvement:

We have modified some items on the senior exit exam that we thought were poor. We continue to refine the test. At present we are unable to compare our graduates to students at other schools. We hope to incorporate a national exam, at least in part, in the future. This would enable us to compare our students to those in biology programs at similar institutions. We see a need to review both our curriculum and pedagogy in an effort to develop programs that will best prepare our majors for the professional roles they seek. We are currently beginning an examination of national standards for evaluating biological literacy and effectiveness of programs in biology. We plan to continue evaluating this student outcome as we evaluate and modify our programs.

A. Student Outcome # 2: (1999-2000)

Students will have access to and be able to use computers and dedicated scientific equipment for word processing, data analysis, internet access, and specific scientific applications. This student outcome applies to all degree programs in the department.

B. Assessment Procedure:

With the renovation of Caylor and Walters Halls, a computer laboratory with 30 IBM-compatible and 12 Macintosh stations is planned. This facility will be sufficient for instruction of students in common software packages such as word processing as well as in advanced applications specific to the sciences. Applications would include analysis of data obtained in laboratory exercises, simulations of biological phenomena, use of statistical methods, utilization of internet web sites for information resources and research. University records documenting set up of the planned computing facility or similar available computing stations within these buildings will assess the students’ access part of the outcome. Majors will take several biology courses requiring computer use in which they will be expected to demonstrate mastery of basic computer skills for biological applications. Several courses likewise require demonstration of ability to appropriately utilize sophisticated equipment and instrumentation. Assessment of the student use and mastery of applications will be by faculty evaluation.
of student performance relative to assignments and objectives included in course syllabi. Assessment will be conducted by faculty each term.

C. Expected Results:

Access to computing facilities, necessary software applications, and equipment and instrumentation will be improved. Majors will take several biology courses requiring computer use in which they will demonstrate mastery of basic computer skills for biological applications. Students will likewise demonstrate ability to appropriately utilize sophisticated discipline specific equipment and instrumentation.

D. Actual Results of Evaluation:

Renovation of the Caylor/Walters complex has not occurred nor have the computing facilities been improved. Some improvement of existing laboratory equipment and instrumentation has been made. The scanning spectrophotometer purchased last year has provided some capability in the plant physiology and ecology laboratory. Where appropriate to course content, a large number of biology courses now include more assignments that require students to use computer technology and/or sophisticated equipment and instrumentation. These assignments include student analysis of experimental results, writing scientific reports, communication with professors and other students via email, and gathering information for research projects from the internet. Faculty document use of equipment, instrumentation, and computer facilities in their courses, and assess development of student skills. Records of student work involving equipment, instrumentation, and computer facilities are included in student portfolios.

E. Use of Assessment Results for Program Improvement:

Today, most advanced biology courses require use of computers to some degree. Many courses require use of sophisticated equipment and instrumentation. Present departmental holdings available for student use are inadequate, there being only one reasonably modern computer with graphic access to the internet that is available for student use. A handful of older and mostly obsolete models are available, but these have limited use as they lack the power to run the software required for today’s scientific applications. Although computer labs are available at other sites on campus, they lack adequate specialized scientific software, and the laboratory help personnel do not have sufficient expertise in scientific applications to assist our students. The planned computer laboratory in Caylor/Walters has not materialized. Also, it should be noted that typical computer labs in the classic sense do not address the need nor do they model computing in the science laboratory where real-time experimentation is being done and analyzed simultaneously. There has been a common misconception by ITS that a traditional computer laboratory will address this problem. Computing facility is needed within science laboratories. An evaluation of this need has been performed and reported to the Dean of the College of Arts and Sciences for inclusion in the next instructional technology initiative.

Acquisition of sophisticated instrumentation and equipment that can be interfaced with computers in the science laboratory is generally lacking. Significant attention needs to be given to addressing this need.
VII. Unit Goals for 2000-2001

A. Unit Goal #1: (continued from 1999-2000)

The department will provide adequate space, equipment, and resources so that students have the opportunity to develop research and technological skills required to succeed in their future employment or professional or graduate training. The department will have a strong commitment to attract high quality students by maintaining facilities that keep pace with current developments in technology.

This unit goal is continued from last year because space, equipment, and resource needs have not been met and are still inadequate. Shortages and needs for adequate space and appropriate equipment and resources have been described in the case statement to the alumni foundation and in the appended assessment report entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University. See that report for a description of requested space and facility needs. This goal was listed as unit goal #2 for 1999-2000.

This goal will be supported in part by our commodities budget. Additionally, four equipment items are requested toward partial fulfillment of this goal. Complete descriptions, uses, and justifications are included in the budget section and/or are appended to this report. Science endowment funds may also be available to provide some support for this unit goal. Summary information is presented below.

Priority 1. CBL Probeware Systems. Total request = $27,430.95
For provision of a technology base that would permeate and serve the entire departmental curriculum both horizontally across the subdisciplines and vertically from the freshman courses through the graduate level.

Priority 2. Microtiter Plate Reader @ $7,450
For broad use in biotechnological applications in approximately 9 departmental courses by about 6 faculty members. It will facilitate student and faculty research. It will provide training in technological skills now required in many employment opportunities. It supports our initiative to broaden exposure of our students to biotechnology in the classroom. We are now largely precluded from such activities.

Priority 3. 4 Polarizing Petrographic Microscopes @ $995 ea. Total = $3980
For support in geology and soils courses in support of the expanded environmental science major and the plant sciences and technology track.

Priority 4. 15 Compound Microscopes @ $1200 ea. Total = $18,000
To replace aged, worn out 33-36 year-old scopes in the botany laboratory. We received end-of-year funds last budget cycle to purchase 5 microscopes. This request would complete this project if fully funded.

B. Institutional Goal:

From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.
(6) Optimize the effective use of technology in support of the education process.
(8) Enhance educational experiences at all levels by encouraging student and faculty research and other creative work.

From 2000-2001 goals statement:
(E) Improve the use of instructional technologies.
(1) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.
(0) Strengthen experiential learning activities
(Q) Pursue federal and private funding.

C. Assessment Procedures:

An evaluation of the adequacy and utilization of all classrooms, laboratories, and equipment was carried out by departmental mission, curriculum, renovation, and instructional technology committees. The assessment was used as a basis to ensure that existing resources are being used efficiently and to propose upgrading of current facilities and equipment. Input from faculty through committees formed to evaluate departmental mission, curriculum, facilities, and computing and instructional technology was gathered regarding needs for specific course and broader program development that will assure competitive programs capable of attracting high quality students. Records of committees actions are present in departmental files and were used in producing a more inclusive assessment report to the department and administration entitled Program and Resource Needs of the Department of Biological Sciences, Delta State University. We will continue to monitor and assess our facilities and other resources in a similar manner for significant change in positive and negative directions relative to this goal.

D. Expected Results

The instructional and research facilities housed in Caylor Hall will be modernized, out-of-date equipment will be replaced, and additional space will be sought to provide students with an environment that exposes them to the latest in scientific instrumentation and computing facilities for learning skills they will need in their future careers. Proposed renovations include: (1) Replacing aging microscopes in the general botany laboratory, (2) purchase of specimen preparation equipment needed to make the existing scanning electron microscope (SEM) fully functional, (3) converting the former photographic darkrooms into student research facilities, (4) upgrading the science museum located in Caylor Hall, (5) modernizing instrumentation for ecology and plant physiology laboratories, (6) providing adequate computer facilities in a local computer lab to facilitate integration of that technology into classroom and laboratory experiences.

E. Actual Results:

To be determined upon completion of next year.
F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 2: (continued from 1999-2000)

Students will work with “cutting edge” middle school and high school textbooks, multi-media resources, and supplementary curriculum materials, e.g., science, technology, and society materials, during their course work in the biology education degree program.

This unit goal is continued from last year because funds for such critical materials have been requested but not provided for in the departmental budget during four of the last five years, thus we still need additional funding to acquire more science education resources. This unit goal was listed as unit goal #3 for 1999-2000.

This goal will be supported to some extent through the commodities and computer software portions of the department’s budget. The CBL probeware requested in Unit Goal #1 also supports this unit goal.

B. Institutional Goal:

Relative to this unit goal, the equipment request supports the same seven university goals as listed above for Unit Goal #1.

C. Assessment Procedures:

Analysis of the department budget and other records of purchases by the College of Education and records of inventoried equipment transfer.

D. Expected Results:

Recent textbooks, other curriculum materials, and equipment for use by preservice science teachers will be obtained. Adequate funding is absolutely critical to attainment of this goal. Funding requested in the Departmental budget for the last several years to begin movement toward attainment of this goal was not forthcoming. To continue to meet NCATE standards for our biology education program it is necessary that we address this issue immediately. The longer we delay in addressing this issue the greater jeopardy our program faces. Use of materials procured with these funds will be infused into projects required of students enrolled in the following courses offered by the department: CUR 493, “Teaching the Sciences”; BIO 334, “Investigating the Natural World”; BIO 435/535, “Methods and Materials in the Biological Sciences; BIO 601,” Problems in Teaching Biology in the Secondary School.”

E. Actual Results:

To be determined upon completion of next year.
F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal #3: (continued from 1999-2000)

The department will initiate curriculum revision to update our program offerings and reflect strategic development of specialized tracks within the BS in Environmental Science major (conservation biology and water quality/management) and within the BS in Biology major (industrial biology, plant sciences and technology, and health professions).

This unit goal is continued from last year because we were only partially successful in completing it. Revisions of the environmental science major and definition of a premedical track within the biology major were achieved. The industrial biology and plant sciences and technology tracks within the biology major have been drafted but have not received final approval. This unit goal was listed as unit goal #4 for 1999-2000. It is supported by the department's general operating budget.

B. Institutional Goal:

From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.

From 2000-2001 goals statement:
(L) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.

C. Assessment Procedures:

Examination of catalog copy and in-house materials to include suggested plans of study will verify creation and changes in programs. We will monitor the number of students following each track and their success in completing academic requirements. Student performance in academic course work will give a measure of mastery of skill and knowledge. Acceptance rates into related employment areas, graduate programs, and professional schools will be a measure of program appropriateness and student success.

D. Expected Results:

We expect completion of plans of study in plant sciences and industrial biology. We expect more of our majors to associate with clearly defined tracts early in their careers and develop prerequisite professional skills, attitudes, and knowledge earlier than before. This should lead to better student awareness and mastery of skills and knowledge necessary to successfully advance in their careers. It will also provide more visibility for departmental programs, provide necessary in-house focus on specific program needs, and allow us to be more responsive in recognizing and
providing needed changes to accommodate marketplace demands on our graduates.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 4: (new goal for 2000-2001)

The department will define a process to annually examine, modify, and/or redefine its mission and unit goals relative to university goals.

This goal will be supported through our general operating budget.

B. Institutional Goal:

This unit goal will involve examination of the department's role in meeting all institutional goals as stated in the 1999-2000 DSU Bulletin and in the statement of University Goals for 2000-2001. This unit goal thus has the potential to support most if not all university goals.

C. Assessment Procedures:

Examination of a mission and goals statement produced by the department. Appearance of revised mission statement and goals in the 2001-2002 bulletin and in other departmental literature and documents.

D. Expected Results:

This should result in formation of a mission and goals statement that reflects proper alignment of department activities with strategic goals of the university.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 5: (new goal for 2000-2001)

The department will initiate a departmental-wide review of its curriculum and pedagogy.

This goal will be supported through our general operating budget.

B. Institutional Goal:
From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address
basic skills, knowledge, and competencies necessary for students to be properly
prepared in their chosen fields, to complete licensure requirements, enter the work force,
and/or continue advanced study in graduate or professional school.

From 2000-2001 goals statement:
(L) Review academic programs for currency in curriculum, pedagogy, instructional
technology use and mission-relatedness.

C. Assessment Procedures:

Examination of documents such as revised syllabi and other documents that
attest to program appropriateness and adequacy relative to constituent demands and
national norms such as “National Science Education Standards” written by the
National Research Council and funded by NSF and the “Benchmarks for Science
Literacy” developed by AAAS. Such norms will be examined and applied relative to
achieving biological literacy in our students in terms of knowledge and applicability of
fundamental principles, concepts, and skills. Examination of methodology for program
and student outcome assessments.

D. Expected Results:

Changes in the broader curriculum and individual courses in terms of content and
pedagogy. Changes in syllabi and/or instructional practices.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 6: (new goal for 2000-2001)

The department will upgrade its efforts and abilities in the area of cell biology and
biotechnology through curriculum revision, dedication of resources, and strengthened
collaboration with the Department of Physical Sciences.

The general operating budget of the department will cover some costs associated with
this goal. The equipment request for a Microtiter Plate Reader in Unit Goal #1 (above)
will support this goal. Some departmental endowment funds may be applied to this
goal. Grant support will be sought to fund additional equipment needs.

B. Institutional Goal:

From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address
basic skills, knowledge, and competencies necessary for students to be properly
prepared in their chosen fields, to complete licensure requirements, enter the work force,
and/or continue advanced study in graduate or professional school.

From 2000-2001 goals statement:
(L) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.
(Q) Pursue federal and private funding.

C. Assessment Procedures:

Verification will be by documentation of changes in related course syllabi, records of dedicated equipment purchases, records of grant activity, records verifying laboratory development and enhancement.

D. Expected Results:

Revision of several courses to include appropriate content and skill development in biotechnological applications. Enhanced laboratory environments and facility for inclusion of teaching biotechnology across the departmental curriculum.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 7: (new goal for 2000-2001)

The department plans to develop a campus arboretum for teaching functions and for utilization in campus and community outreach functions.

The general operating budget of the department will cover minor costs associated with this goal. Minor departmental endowment funds may be applied to this goal. Grant support will be sought to partially fund this goal. Some grants will require matches. Donations will be integral to the larger base of support for this project and will require significant commitment of university officials and foundation and development officers. The university will need to develop a budgetary plan, support personnel plan, and physical plant support plan to supplement departmental input in developing and maintaining this initiative.

B. Institutional Goal:

From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.
(5) Accommodate non-traditional students and the general public by offering a comprehensive program of continuing education, including off-campus classes, independent study courses, non-credit courses, conferences, and workshops.
From 2000-2001 goals statement:
(H) Refine and coordinate more effectively community and economic development activities.
(I) Support interdisciplinary centers that contribute to our regional mission.
(J) Beautify the campus.
(L) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.
(O) Strengthen experiential learning activities.
(Q) Pursue federal and private funding.
(R) Seek ways to enhance student life on campus.

C. Assessment Procedures:

Examination of records that relate concept approval and authorization by extra-departmental university officials. Examination of records and landscaping plans that demonstrate initiation of activities associated with startup of the project. Examination of copies of announcements and news releases. Examination of budget expenditure records associated with this goal. Examination of grant proposals written in support of this goal. Examination of on-site improvements resulting from activities spawned by this goal. Examination of departmental, campus, and broader community responses to teaching and outreach programs associated with this goal.

D. Expected Results:

We expect the assessment process to demonstrate authorization to proceed with this goal. We expect to be able to demonstrate measurable progress in implementation of early stages of the project including designation of a discrete grounds space by university officials for setup of logistical operations, development of a university plan of personnel and funding support, submission of one or more grant proposals for outside support, action by the development office in raising of private funds in support of this project, development of one or more community outreach activities, incorporation of related learning activities into some departmental course curricula, and some actual plantings and grounds improvement.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

A. Unit Goal # 8: (new goal for 2000-2001)

The department plans development of a functional Center for Science and Environmental Education (CSEE) to meet the resource, professional development, and other educational support needs of Delta school districts, science teachers, and their students; to provide for continuing science education experiences for the broader community; and to provide experiential learning activities for our departmental science education majors.
The ability to bring this goal into functional reality is limited by support in the area of funding, facility, and personnel. The departmental budget can supply only limited funding. This center needs its own assigned budget to support initial development. Provision of personnel support for an initial grant-writing and development phase is a must for any strategic development to take place. The department has requested a new biology education position to relieve Dr. Malcolm McEwen of many routine duties that preclude his active pursuit of achieving this goal. We have also recommended change of his status to a 12-month director’s position so that he can devote appropriate time and energy to development of an extramural funding base and to coordination of efforts designed to achieve this goal. University officials are herein asked to designate a discrete facility space for setup of logistical operations. Lacking suitable space in our current building and on campus, we request that the old pickle-plant facility and adjacent grounds at Merigold, MS be assigned to the department for development of the CSEE logistical operations base. It will provide adequate space for initial activities including acquisition, development, and storage of science education materials, work group activities, and distribution operations. Some funding would likely be necessary to restore the Merigold facility to a clean and functional facility in keeping with the image of DSU. An initial startup budget for the CSEE to begin initial operations should be established.

At present, the functional ability of the CSEE is viewed as dependent on possible receipt of funding support through the joint proposal with the USFWS to build a facility at the Dahomey National Wildlife Refuge. That would be several years distant, if that proposal is approved and funded. However, the CSEE is a goal that needs to be made functionally viable ASAP and independently of the USFWS proposal. This is so that progress may be made in the interim towards meeting CSEE goals and to begin the initial development that will support its expanded capacity should the USFWS proposal become reality. Should the USFWS and DSU joint proposal fail to gain approval, the need for DSU to carry out this initiative in science education will still exist and must be addressed.

B. Institutional Goal:

From 1999-2000 bulletin:
(1) Review and update undergraduate and graduate programs to adequately address basic skills, knowledge, and competencies necessary for students to be properly prepared in their chosen fields, to complete licensure requirements, enter the work force, and/or continue advanced study in graduate or professional school.
(5) Accommodate non-traditional students and the general public by offering a comprehensive program of continuing education, including off-campus classes, independent study courses, non-credit courses, conferences, and workshops.

From 2000-2001 goals statement:
(H) Refine and coordinate more effectively community and economic development activities.
(I) Support interdisciplinary centers that contribute to our regional mission.
(L) Review academic programs for currency in curriculum, pedagogy, instructional technology use and mission-relatedness.
(O) Strengthen experiential learning activities.
(Q) Pursue federal and private funding.
C. Assessment Procedures:

Examination of records that relate concept approval and authorization by extra-
departmental university officials. Examination of records that demonstrate initiation of
activities associated with startup of the project. Examination of copies of
announcements and news releases. Examination of budget expenditure records
associated with this goal. Examination of grant proposals written in support of this
goal. Examination of physical on-site developments resulting from activities spawned
by this goal. Examination of science education community responses to service and
outreach programs associated with this goal.

D. Expected Results:

We expect the assessment process to demonstrate authorization to proceed with this
goal. We expect to be able to demonstrate measurable progress in implementation of
early stages of the project including designation of a discrete building space by
university officials for setup of CSEE logistical operations, development of a university
plan of personnel and funding support, submission of one or more grant proposals for
outside support, action by the development office in raising of private funds in support
of this project, development of one or more programs or activities for science educators,
incorporation of related learning activities into several departmental science education
course curricula and school curricula.

E. Actual Results:

To be determined upon completion of next year.

F. Use of Results:

To be determined upon completion of next year.

VIII. Student Outcomes: (2000-2001)

Degrees: Majors

BS: Biology
BS: Environmental Science
BSE: Biology Education
MSNS: Biological Sciences

A. Student Outcome # 1: (2000-2001)

Students will acquire a broad knowledge of the fundamental principles, concepts, and
skills attendant to biological literacy. They will be able to make connections between
concepts and demonstrate higher order thinking skills (application of skills and
concepts in creative and critical thinking, problem solving, data analysis, etc.). This
student outcome applies to each degree program in the department with appropriate
emphasis assigned to discipline specific areas of uniqueness.
B. Assessment Procedures:

Acceptable performance in course work and progression through the respective major sequence will testify to acquisition of requisite biological literacy and performance ability. A portfolio of example work will be created for each student. Materials included in the portfolio will be used to examine the student's proficiency in key areas of biological science to include writing, data analysis, and evidence of knowledge of fundamental principles and concepts. Graduating students will take a departmental senior exit exam administered during their final semester. The senior exit exam is given near the end of each semester to graduating seniors. Test items have been constructed by all faculty to represent a cross-section of the basic knowledge needed by students completing a major in the department. Test results are summarized by subject area to determine specific strengths and weaknesses. We have studied the possibility of combining this "in house" test with a nationally normed test.

C. Expected Results:

The portfolio of acceptable example work created for each student will demonstrate the student's proficiency in key areas of biological science. Graduating students will achieve acceptable scores on the departmental senior exit exam administered during their final semester.

D. Actual Results:

To be determined upon completion of next year.

E. Use of Results:

To be determined upon completion of next year.

A. Student Outcome # 2: (2000-2001)

Students will have access to and be able to demonstrate appropriate use of computers and dedicated scientific equipment for word processing, data analysis, internet access, and specific scientific applications. This student outcome applies to all degree programs in the department.

B. Assessment Procedure:

With the renovation of Caylor and Walters Halls, a computer laboratory with 30 IBM-compatible and 12 Macintosh stations is planned. This facility will be sufficient for instruction of students in common software packages such as word processing as well as in advanced applications specific to the sciences. Applications would include analysis of data obtained in laboratory exercises, simulations of biological phenomena, use of statistical methods, utilization of internet web sites for information resources and research. University records documenting set up of the planned computing facility or similar available computing stations and the purchase of equipment and instrumentation for laboratory use within these buildings will be used in assessment of improved student access.
Where appropriate to course content, a large number of biology courses now include assignments requiring students to use computer technology and/or sophisticated equipment and instrumentation. These assignments include student analysis of experimental results, writing scientific reports, communication with professors and other students via e-mail, and gathering information for research projects from the internet. Faculty will document required use of equipment, instrumentation, and computer facilities in their course syllabi and assignments, and assess development of student skills through evaluated student work. Example records of student work involving equipment, instrumentation, and computer facilities are included in student portfolios.

C. Expected Results:

Access to computing facilities, necessary software applications, and equipment and instrumentation will be improved. Majors will take several biology courses requiring computer use in which they will demonstrate mastery of basic computer skills for biological applications. Students will likewise demonstrate ability to appropriately utilize sophisticated discipline specific equipment and instrumentation.

D. Actual Results:

To be determined upon completion of next year.

E. Use of Results:

To be determined upon completion of next year.

IX. Unit Budget Plan
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ORGANIZATION: 0311 Biological Science
FUND: 10 Unrestricted General Fund

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<th>PHASE 2: CHANGE</th>
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Justification:

1. Rental of Office Equipment

   Actual cost of imaging rental and service for this year will exceed the budgeted amount of $1000 by an estimated $1750.

2. Postage & Post Office Charges

   Actual cost of postage, etc. will exceed the budgeted amount by an estimated $430. This reflects an intense effort in recruitment mailouts, fund-raiser mailouts, and newsletter mailouts.
### Delta State University

**Unit Budget Plan**
**FY 2001 Budget**
**As of 07-Mar-2000**

**Organization:** Biological Science  
**Fund:** Unrestricted General Fund

<table>
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<tr>
<th>Prior Year</th>
<th>Phase 1: Adjust</th>
<th>Phase 2: Change</th>
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<td>2000 Adjusted</td>
<td>Amount Request</td>
<td>Amount 2001</td>
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**Organization Total**:
- Total Revenue: $0.00  
- Total Labor: $683,577.00  
- Total Expense: $49,391.00  
- Total Transfers: $0.00  
- Total Net: $-732,968.00

<table>
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<tr>
<th>Prior Year</th>
<th>Phase 1: Adjust</th>
<th>Phase 2: Change</th>
<th>Phase 3: Approved</th>
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<td>1999</td>
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<td>Amount Request</td>
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ADDENDUM

Special Equipment Requests
Department of Biological Sciences

FY 2001

and

Assessment Report

Program and Resource Needs of the Department of Biological Sciences
Delta State University
Priority Ranking of Special Equipment Requests by the Department
(Full descriptions for items 1-3 follow this page)

Priority 1. CBL Probeware Systems. Total request = $27,430.95

For provision of a technology base that would permeate and serve the entire departmental curriculum both horizontally across the subdisciplines and vertically from the freshman courses through the graduate level.

Priority 2. Microtiter Plate Reader @ $7,450

For broad use in biotechnological applications in approximately 9 departmental courses by about 6 faculty members. It will facilitate student and faculty research. It will provide training in technological skills now required in many employment opportunities. It supports our initiative to broaden exposure of our students to biotechnology in the classroom. We are now largely precluded from such activities.

Priority 3. 4 Polarizing Petrigraphic Microscopes @ $995 ea. Total = $3980

For support in geology and soils courses in support of the expanded environmental science major and the plant sciences and technology track.

Priority 4. 15 Compound Microscopes @ $1200 ea. Total = $18,000

To replace aged, worn out, broken, and irreparable 33-36 year-old scopes in the botany laboratory. Current scopes in this laboratory were salvaged from general biology and general zoology laboratories when new scopes were acquired about 6 years ago. We received end-of-year funds last budget cycle to purchase 5 microscopes for the botany laboratory. This request would complete this project if fully funded.
The Department of Biological Sciences has a pressing need to increase the amount of technology utilized in its three degree programs—biology, environmental science, and biology education. One way in which we desire to address this problem is by obtaining computers for use by students enrolled in courses offered by the department. These computers would be housed in the departmental teaching laboratories thus allowing the machines to be used during laboratory periods for the purposes of data analysis and laboratory report preparation. This aspect of the technology plan has been well developed with further information concerning the plan available in a report submitted to the Dean of the College of Arts and Sciences.

To augment the computers that would be available in each laboratory we propose to acquire and utilize graphing calculator/calculator interface/probeeware systems. This type of system, better know as a Calculator-Based Laboratory (CBL) system, would allow students to design experiments, collect data, and download the data to a computer for further analysis. Availability of CBL systems in the laboratory decreases the need to have a computer for each group of two students. CBL systems are designed to interface with computers easily and efficiently. The specific CBL systems that we propose to acquire consist of a TI-83 Plus graphing calculator, a LabPro Interface, and a range of specialized probes and sensors that allow assessment of such parameters as pH, dissolved oxygen, temperature, conductivity, carbon dioxide levels, etc. Since the CBL system described above is highly portable these systems can be used in the laboratory as well as the field. Specific cost and ordering information for these systems appears below.

CBL systems will provide the department a technological base on which to build data analysis capabilities. We envision the CBL technology permeating our entire biology curriculum. Students will begin using the CBL technology as freshmen during their “Principles of Biology” course and continue using that technology in other courses included in the biology curriculum. This frequent use of the technology by students coupled with its infusion into the majority of biology courses would make our investment in CBL technology cost effective.

We are requesting that funds be included in the 2000-2001 budget to cover purchase of the following materials associated with the CBL system:

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<th>Catalog no.</th>
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BAR-BTA  6  Barometer  58.00  348.00
LS-BTA  6  Light Sensor  45.00  270.00

TOTAL  $27,430.95

The suggested vendor is: Vernier Software; 8565 S.W. Beaverton-Hillsdale Hwy.; Portland, OR 97225-2429. Phone: 503-297-5317; web site: www.vernier.com

*Each LabPro Biology Package includes the following items:

LabPro interface
Stainless steel temperature probe
Exercise heart rate monitor
Gas pressure sensor
Oxygen gas sensor
 Conductivity probe
 Colorimeter
 Dissolved oxygen probe
 pH sensor
 EKG sensor
 Respiration monitor belt
Memorandum

Date: 3/30/2000
To: Dr. Ed Williams, Chair, Department of Biological Sciences
Cc: [ Click here and type names ]
From: Keith Hughes
RE: Equipment Requests

Request:

I am requesting a Microtiter Plate Reader for the Department of Biological Sciences.

Vendor:

The suggested vendor for this piece of equipment is Fisher Scientific.

Cost:

The list cost of this item in the 2000 – 2001 Fisher Scientific Catalog is $7,450.00.

Use:

A microtiter plate reader is an essential piece of equipment that can be used in a multitude of courses by different faculty members. I can easily envision this piece of equipment being used in BIO 100, BIO 102, BIO 317, BIO 318, BIO 301, BIO 201, BIO 442, BIO 405, and BIO 464.

Justification:

In order to ensure that our students are marketable when they graduate from Delta State University, the Department of Biological Sciences requires the necessary equipment to teach our students various techniques. Currently, many of the biological techniques used in the "real world" employ microtiter plate based assays. These tests include protein quantitation, enzyme assays, ELISA's, nucleic acid quantitation and antibody determination. Without a microtiter plate reader, we are unable to teach our students these techniques; therefore, our students are not as marketable as graduates of other institutions.
Request for four Student Polarizing Microscopes

Description:
A polarizing microscope would have a polarizer and rotating analyzer. Other desirable features would include coarse and fine focus controls, a gypsum first-order red plate and mica quarter-wave plate to provide exquisite detail and clarity for mineral identification.

Costs:
$995.00 per microscope

Use:
1. Dr. Nina L. Baghai-Riding will use it in teaching various laboratories pertaining to Biology 314 (Physical Geology for Biologists), Environmental Science (Biology 201) and for the new proposed course called Environmental Geology. These microscopes will be used to study thin-sections made of assorted rocks and minerals.
2. Dr. Sam Faulkner will use it for teaching laboratories in his undergraduate/graduate course called Soil Science.
3. Students will use the microscopes for assorted graduate/undergraduate student research projects.

Justification:
The acquisition of these microscopes will support the developing Environmental Science and Plant Science Curricula. Polarizing microscopes will be used for assorted laboratories in Soil Science, Physical Geology for Biologists, Environmental Science and Environmental Geology. At the present the department lacks polarizing microscopes. These types of microscopes are necessary to accurately identify thin-sections made of rocks and minerals. Polarized light allows studying various double refraction wavelength patterns, symmetry and cleavage properties that are characteristic of minerals. Polarized light is not a property of compound light microscopes. Microscopic properties of minerals are constant and reliable and do not vary unlike those of hand specimens of rocks and minerals. Students will then be able to study and compare hand specimen and thin-sections properties of rocks, minerals and soil samples simultaneously.

Requested by Nina L. Baghai-Riding