FIVE-YEAR ASSESSMENT AND EVALUATION REPORT
2000-2005

DEPARTMENT OF BIOLOGY

COLLEGE OF ARTS AND SCIENCES

DR. GOLDIE BYRD, CHAIR
DR. MARY SMITH, ASSOCIATE CHAIR

I. Brief Overview of Department and Programs

The Department offers programs of study that lead to degrees in the following areas:

Biology – Bachelor of Science
Biology – Master of Science

The Biology programs prepare students to become professional biologists in the nature of scientific investigation, the principles of biology, and the value of scientific enterprise. Graduates are prepared for research careers in academia, industry, and government or graduate study in the biological sciences, or advanced study in professional schools (i.e. medical, dental, and veterinary). The Department also provides courses in biology that fulfill the general education core requirements of the University, and cognate courses for students majoring in or receiving certification in other fields including, but not limited to, agricultural sciences, home economics, nursing, horticulture, and physical education. In addition, the department serves as a resource to the University and the community through cooperative programs, workshops, seminars, course offerings, and public service. The faculty and students conduct research and scholarly activity in the areas of biology, biotechnology, computational biology, and biology education. The Department of Biology offers opportunities for students to obtain degrees in the University-wide interdisciplinary graduate programs: the Comprehensive Science & Engineering MS program and the Ph.D. in the Environmental Science program.

II. Strategic Plan

A. Vision

The Department's **vision** is to become the premier department in providing educational opportunities and advancing students toward terminal graduate and professional degrees and successful careers in the biomedical sciences. The Department's core values include a commitment to excellence, responsiveness, accountability, intellectual growth, inclusiveness and collaborative engagement.

B. Mission

The Department of Biology's mission is to educate students to become competent, competitive and confident leaders who will excel in the global scientific community. Specifically, its programs are designed to enhance the intellectual and creative abilities of all individuals that it serves by fostering life-long learning, inquiry and self-evaluative leadership.

C. Goals/Objectives

1. Develop an excellent faculty in the Department of Biology that demonstrates quality classroom instruction, scholarly productivity and service through partnerships and collaborations.

2. Provide high quality and visionary curricular and extracurricular programs that lead to the baccalaureate and masters degrees in biology.

3. Create a resource department that fosters collaborative outreach through interdisciplinary and inter-institutional projects and programs.

4. Develop a responsive department by providing quality services, activities and facilities that enhance intellectual, cognitive, social and personal competencies and that meet the needs of faculty staff and students.

5. Enhance and diversify the department's resource base through effective fundraising and sponsored research.

C. Goals/Objectives

GOAL 1. Develop an Excellent Faculty in the Department of Biology That Demonstrates Quality Classroom Instruction, Scholarly Productivity and Service Through Partnerships and Collaborations

1. Outcomes Achieved/Results

a) Increased faculty participation in developmental activities for research and teaching
b) Increased the number of grants submissions for research, student training and departmental resources
c) Increased number of faculty publications, abstracts, books and invited talk and lectures
d) Increased the number of technology-based courses
e) Increased the number of faculty members serving on review panels for journals, books and funding agencies at the local state and national levels
f) Increased number of faculty attending workshops, national meetings and conferences
g) Increased service to community through public symposia and workshops and enhanced service on University state and national committees

2. Assessment Measurements (qualitative or quantitative measures; e.g., surveys, questionnaires, etc)

a) The department uses the University's student evaluation to assess faculty performances in the classroom.
b) The annual evaluation (Document III Self Evaluation) is used to assess the levels of scholarly productivity, service and curricular enhancement for each faculty member.
c) The department uses the expert advice from an external advisory group to assess the level of effectiveness of research in the department.
d) The department uses exit interviews and surveys to assess student satisfaction with teacher effectiveness and overall program experience in the Department of Biology.

3. **Assessment Procedures (describe the procedures for using the assessment measurements to collect data or information required).**
   a) *Teaching. Student evaluations collected for each course and results are returned to the department for review by each faculty member and the Chair of the Department. The Chair or Associate Chairperson also visits classrooms to observe faculty effectiveness. Data from student evaluations are kept in the departmental file for each faculty member.*
   b) *Research. Assessments of published papers, scientific presentations and funded grants are assessed at the end of each academic year in the annual report. The external advisory group assesses the level of productivity in the department and makes recommendations to strengthen the program.*

4. **Administration of Assessment Procedures (Who is responsible for conducting or administering assessment procedures?)**
   a) *Each faculty member administers the student evaluation surveys. The Department Chair or Associate Chair observes each new faculty member at least once per year. For existing faculty, observances are made every three years and for tenured faculty, observances will be made every five years. If student feedback warrants more frequent visits, the Department Chair makes the visits.*
   b) *The Department Chair and Associate Chair interview each faculty member to review accomplishments and areas for needed improvement, in preparation for annual evaluations. The Department Chair and Associate Chair review and prepare a final Document IV as a part of the annual evaluation of faculty.*

5. **How findings from assessments are used to improve the program (describe how findings will be/were used for program improvement, e.g., course/workshop/seminar revision, budget planning, etc.).**
   a) *The Chairperson and Associate Chairperson, along with specific departmental committees, make ongoing assessments and determine research trends that are compatible with the Department's goals. They assist with deciding on curricular changes, seminar focus areas, and research specialties needed for incoming faculty members, and workshop and faculty development opportunities that would most benefit the faculty and the department.*

Comment [l1]: Provide examples of specific improvements to the program based on the 2005-2006 assessment data.

GOAL 2. Provide High Quality and Visionary Curricular and Extracurricular Programs that Lead to the Baccalaureate and Masters Degrees in Biology

1. **Outcomes Achieved/Results**
   a) *Included more research-based courses, which better promotes critical thinking, research design, data assessment and communication skills*
   b) *Upgraded laboratory-based courses include more hands-on experiences in data analysis, writing and critical thinking*
   c) *Increased number of students engaging in summer internships and academic year research.*
   c) *Increased students participation in more technology-based courses including bioinformatics,molecular biology, epidemiology and biostatistics.*

Comment [l2]: Give examples of courses added.

e) Developed a capstone course that requires a research experience, and implementation of well-developed critical thinking, data analysis and communication skills
f) Established a supplemental instruction program in calculus
g) Developed a physical infrastructure that supports research
h) Created an organizational support structure that facilitates the mission of the Department of Biology
i) Developed a long-range strategic retention plan that insures student success

2. Assessment Measurements (qualitative or quantitative measures; e.g.,surveys, questionnaires, etc)

a) The Department Chair, Associate Chair and Advising Coordinator monitored student grades and progress at midterm and at the end of semester intervals.
b) The Department Chair held exit interviews for each graduating student.
c) Alumni surveys will be mailed to alumni every five years to seek level of satisfaction with the department's efforts and to seek alumni support.
d) The department held an external review that included experts from major universities all over the country. The team reviewed the undergraduate and masters degree programs, facilities, departmental support and faculty scholarly activity and faculty mentoring efforts.
e) New and innovative course offerings

3. Assessment Procedures (describe the procedures for using the assessment measurements to collect data or information required)

a) Student grades are monitored at the end of each semester and at midterm.
b) Course offerings are monitored and compared with curriculums from similar institutions.
c) An external assessment spent a day and a half in the Department. They observed teaching, research facilities, and infrastructure. They talked with faculty, staff and students and administrators in the College of Arts and Sciences.

4. Administration of Assessment Procedures (Who is responsible for conducting or administering assessment procedures?)

a) The Department Chair, Associate Chair and Advising Coordinator monitored student grades and progress.
b) The Department Chair held exit interviews for each graduating student.
c) The Department Chair will mail alumni surveys and assess survey results.
d) The External Review team was composed of scientists from Michigan State University, Tennessee state University, the Morehouse School of Medicine and the National Science Foundation. Results of the external assessment were summarized by the committee and reports were mailed to the Department.

5. How findings from assessments are used to improve the program (describe how findings will be/were used for program improvement, e.g. course/workshop/seminar revision, budget planning, etc.).

a) Assessment of student grades led to more effective advising at midterm.

Comment [I3]: What is the organizational support structure? Describe it briefly.

Comment [I4]: How are student grades and exit interviews related to providing high quality and visionary curricular and extracurricular programs? New and innovative course offerings, along with a review of curriculum at peer institutions, would seem to be a better measurement.

Comment [I5]: See previous comment (#2 above).

Comment [I6]: Provide examples of some of the "more effective advising" strategies.

b) Exit interviews with graduating students have led to plans for expanding the curriculum, offering more research opportunities and partnering with students to improve advising and student communities.

c) The external assessment allowed the faculty to assess where we are and where we need to be with respect to similar institutions. The assessment was very thorough and provided constructive criticism and encouragement for expanding the curriculum, increasing the departmental budget, seeking external and University support and planning for better faculty development.

GOAL 3. Create a Resource Department that Fosters Collaborative Outreach through Interdisciplinary and Inter-institutional Projects and Programs

1. Outcomes Achieved/Results

a) Hosted an annual life and physical sciences symposium, bringing in more than 500 participants and speakers from the University, across the state and nation to discuss contemporary issues in the biological sciences.

b) Implemented a vibrant monthly interdepartmental seminars series with participants from Departments of Chemistry and Psychology, the School of Agriculture and Environmental Sciences and the Institute for Public Health.

c) Participated in the development of new Masters and Ph.D. programs with other colleges and schools.

d) Developed a Math/Science proposal to train students at the interface of Mathematics and Biology

e) Launched a campus-wide Healthy Lifestyle Challenge with participants from all campus colleges and schools.

f) Launched a Summer Institute in Genome Science and Academy for rising high school juniors

g) Hosted annual workshops on current topics in research for faculty and students and that were open to any faculty and student in the sciences.

h) Significantly increased the number of funded faculty-initiated research and student training collaborations with on-campus and off-campus mentors and partners.

i) Conceptualized the feasibility of an interdisciplinary Masters Degree in Microbiology.

2. Assessment Measurements (qualitative or quantitative measures; e.g., surveys, questionnaires, etc)

a) The symposia, workshops and seminars use survey evaluation instruments

b) The annual evaluation is used to assess the extent of collaborative scholarly activities

c) Funding agencies evaluate grant? applications for their intellectual merit and broad impact

d) Academic programs are new and have not yet been evaluated

Comment [I7]: What kind of annual evaluation is this? Faculty annual reports?

Comment [I8]: But, what is the plan for evaluating them?

3. Assessment Procedures (describe the procedures for using the assessment measurements to collect data or information required).
   a) During each symposium, each participant is asked to complete an evaluation. These tools are handed out in their registration folders.
   b) After each seminar, students are asked to evaluate seminars.
   c) Program participants for the Healthy Lifestyle Challenge are asked to evaluate each component of the program through its website and surveys.

Comment [l9]: These evaluation measure satisfaction with programs. How will you know that collaborations are taking place as stated in Goal 3?

4. Administration of Assessment Procedures (Who is responsible for conducting or administering assessment procedures?)
   a) Dr. Mary Smith (Chair of Symposium and Seminar Committee) receives evaluations regarding each. Dr. Vinaya Kelkar, the departmental bio-statistician, assesses the evaluations and determines and summarizes trends, skills and attitudes from them.
   b) Dr. Vinaya Kelkar makes assessments of progress and value of the program, for the Healthy Lifestyle Challenge.
   c) Faculty and students in the Department of Biology assist with administering the evaluations for the symposia.

Comment [l10]: Who will be responsible for tracking the collaborations?

5. How findings from assessments are used to improve the program (describe how findings will be/were used for program improvement, e.g., course/workshop/seminar revision, budget planning, etc.).
   a) Findings from debriefings and assessments are used to improve symposia, workshops and seminars for subsequent years. Program assessments from the Healthy Lifestyle Challenge have assisted us in conceptualizing proposals for a continuation of the program.

Comment [l11]: If this relates to collaborations, give a brief description of what you found from debriefings and assessments that will be used to improve symposia, workshops and seminars.

GOAL 4. Create a Responsive Department by Providing Quality Services, Activities and Facilities that Enhance Intellectual, Cognitive, Social and Personal Competencies and Needs of Faculty, Staff, and Students

1. Outcomes Achieved/Results

a) The Department initiated an annual Graduate Student Retreat to educate students about how to survive graduate school, provide information, to receive information from them regarding their needs for success in the program. These retreats are held on and off campus facilities and provide a social context for them as well.
b) Renovated and furnished a Resource Room for Graduate Students
c) Held monthly faculty meetings and an annual faculty retreat
d) Redesigned the front office to assist with reorganization and to improve the efficiency of the office so that students and faculty are better served
e) Renovated the conference room to facilitate collaborations and created new SMART Classrooms to facilitate internet-based learning.
f) Established an annual and informative new student orientation at the beginning of each school year to introduce students to advisors and advisors to students, and to share

important information about student matriculation.

g) Hired support staff and technical staff to assist faculty with research, proposal development, grant implementation and data analysis and the introduction of technology into the classroom.

h) Conducted an external review of the department.

2. Assessment Measurements (qualitative or quantitative measures; e.g., surveys, questionnaires, etc)

a) Student evaluations and surveys for retreats
b) Faculty evaluations at retreats
c) Exit interviews and surveys of graduating students
d) Summary of external evaluation of the department

3. Assessment Procedures (describe the procedures for using the assessment measurements to collect data or information required).

a) Student satisfaction with faculty and the department in general, is assessed by end of semester evaluations, through exit interviews and qualitative discussions at the graduate retreat.
b) At the end of each retreat, faculty members are asked to assess the effectiveness through use of an evaluation form.
c) Each graduating student provides an oral and written exit interview with the Chairperson. Graduating students have a one-on-one discussion and complete a written survey.
d) Experts in the biological sciences from Tennessee State University, the National Science Foundation, Morehouse School of Medicine and Michigan State University met for one and a half days to review the curriculum, scholarly productivity of faculty, student profiles, research and training infrastructure, departmental resources, including operating budget, student mentoring and retention, budget, capability of the leadership, strategic goals and efficiency of support staff in the Department of Biology.

4. Administration of Assessment Procedures (Who is responsible for conducting or administering assessment procedures?)

a) The Department Chair and Associate Chair collect all evaluative information. The department's biostatistician does analysis on evaluations.

5. How findings from assessments are used to improve the program (describe how findings will be/were used for program improvement, e.g., course/workshop/seminar revision, budget planning, etc.).

a) Evaluations of retreats, such as the graduate student retreat, guide our actions to better provide resources for faculty and students. Out of the first retreat, students indicated that they needed a special gathering place for students. We subsequently renovated a space and had a ribbon cutting for them. Another example is the faculty retreats where the department discusses problems as well as long-term and short term goals. These are held at the end of the academic year and are used to drive actions for the next year. They are also used to conceptualize departmental goals and assessment strategies, e.g. the five

year assessment. One outcome of faculty request was the renovation of a space for faculty to engage in discussion around their lunch time. The departmental faculty lounge was created.

GOAL 5. Enhance and Diversify the Department's Resource Base through effective Fundraising and Sponsored Research

1. Outcomes Achieved/Results

a) Increased sponsored research by submitting and winning awards totaling more than $6 million in the past three years and submitting applications totaling more than $10 million.
b) Increased fundraising by engaging biology alumni to support a newly established $1million endowed scholarship campaign for the department.
c) Initiated an annual alumni scholarship auction to support student scholarship and student activities
d) Established an alumni advisory board to assist with fundraising
e) Launched new advertisements that attract donors to the department
f) Made visits to pharmaceutical companies to initiate partnerships for student internships and scholarships

2. Assessment Measurements (qualitative or quantitative measures; e.g., surveys, questionnaires, etc)

a) Spread sheets and web-based surveys are used to assess the progress made in attaining new resources for the department.

3. Assessment Procedures (describe the procedures for using the assessment measurements to collect data or information required).

a) Assessments of fundraising activities from sponsored programs and pharmaceutical are made as a compilation in the annual report. Assessment of alumni giving is made during monthly reports. The Grants Administrator in the Department of Biology keeps a spread sheet on any incoming dollars to the department. The Program Evaluation Group (external evaluator) uses web based surveys to assess the extent of sponsored programs in the department.

4. Administration of Assessment Procedures (Who is responsible for conducting or administering assessment procedures?)

a) The grants administrator makes ongoing reports to the Department Chair and Associate Chair of all monies that are received from alumni, corporate sponsors, and sponsored programs. The Department Chair summarizes the assessment in the annual report. The Dean for the College of Arts and Sciences and the Vice Chancellor for Research also assess the sponsored research productivity for the Department of Biology. The Program Evaluation group assists with summative and formative evaluation of sponsored programs, with respect to their effectiveness.

5. **How findings from assessments are used to improve the program (describe how findings will be/were used for program improvement, e.g., course/workshop/seminar revision, budget planning, etc.).**
   a) *Assessments of new resources to the department assists us in planning for research and training and research activities. Significantly increasing external allows the department to plan for seminars, workshops, faculty development opportunities, supports for students, enhanced curriculum and enhanced infrastructure. Assessing growth in funding allows the department to strategically plan for new curricula and new support programs.*

III. How is Department's Strategic Plan Related to the College's Strategic Plan and the University's Mission and Goals? The Department's strategic plan is consonant with the mission and goals of the College of Arts and Sciences and the University. The primary aim of the College of Arts and Sciences is "to provide students with a global educational experience which prepares them to perform in a variety of dynamic leadership and employment situations". The department's mission is in alignment with the College and University's mission and goals to prepare students through interdisciplinary learning and discovery and to assume leadership roles in a global society. The department develops and participates in a number of activities that support the University's FUTURES-related themes to foster (a) distinctive, interdisciplinary programs (b) strategic partnerships, (c) enhanced and diversified resources, (d) responsive learning environments and (e) globalized programs.

A. Student Profile (data for the past three-five years including the current academic year)

1. Admission requirements

The admission of students to the Bachelor of Science degree program in the Department of Biology is based on the general admission requirements of the University. Admission of students to the Master of Science in Biology degree program is based on the general admission requirements of the School of Graduate Studies. In addition, the applicant must have completed at the undergraduate level chemistry through Organic II, one year of calculus, one year of physics (calculus-based physics preferred), and courses in cellular and molecular biology. Students lacking these requirements may be given provisional admission and be required to successfully complete some or all of these courses before being admitted to candidacy.

2. Total Enrollment in Programs

The table below gives fall enrollment for the years 2002 through 2005 at the undergraduate and graduate level for the Department of Biology and the College of Arts & Sciences. In parentheses is the percent change from the previous year.

YEAR	FALL 2002	FALL 2003	FALL 2004	*FALL 2005*
UGRAD BIOL	217	265 (+22.1%)	292 (+10.2%)	*299 (+2.4%)*
UGRAD A&S	1884	2134 (+13.3%)	2411 (+13.0%)	*2817 (+16.8%)*
GRAD BIOL	27	19 (-29.6%)	24 (+26.3%)	*23 (-4.2%)*
GRAD A&S	*156*	*171 (+9.6%)*	*174 (+1.8%)*	*194 (+11.5%)*

3. Number of Majors in Honors Program

Number of Biology Students Enrolled in the Honors Program Per Year					
Year	2001	2002	2003	2004	2005
Number	9	4	6	7	8

4. Number of Transfers (Average Admission GPA)

Number of Transfer Students per Year			
Year	2003	2004	2005
Number	13	12	11

5. Progression Requirement (N/A)

6. Enrollment in Degree Credit Distance Learning (N/A)

B. Academic Major /Program (past three year)

1. Results of any licensure examinations (N/A)

2. Accreditation Reviews (N/A)

3. Internal Program reviews (Outside Consultants)

The department held an external review that included experts from major universities all over the country in 2003. The team reviewed the undergraduate and Masters degree programs, facilities, departmental support and faculty scholarly activity and faculty mentoring efforts. The outcome of the assessment was the following 10 recommendations:

- Reduce by one half the number of courses offered in the catalog.
- Establish at least two thematic focus areas for departmental faculty research and scholarship
- Redesign the graduate course offerings to reflect the emerging research emphases and strengths.
- Design multiple, thematic course work tracks for the Biology majors

- Establish a core of courses for all majors and provide electives for the specific degree tracks.
- Abandon attempt to offer a teaching laboratory experience with almost every course.
- Design two teaching laboratory courses to replace all current laboratory offerings.
- Consider developing an undergraduate capstone course as alternative to an undergraduate research exposure.
- The budget for faculty and staff FTEs in Biology should contain specific support for service teaching responsibilities.
- Develop and utilize team-teaching approaches to decrease faculty workload while sustaining student capacity.

4. Retention and Graduation (1997 – 2004)

The number of freshman entering the program has consistently increased to over 300 since 2003.

For freshman cohorts entering in years 1997 through 2004, the average 1 year retention has been 74.3% (lowest: 64.2% (2001), highest 83.9% (2000), the average 2 year retention has been 56 % (lowest: 53.3 % (1998), highest 74.2 % (2000), the average 3 year retention has been 56.6 % (lowest: 46.6 % (1998), highest 66.1 % (2000), and the average 4 year retention has been 25.26 % (lowest: 20.7 % (1998), highest 32.0 % (1997).

During this same period the average 4 year graduation rate has been about 26%, whereas the average 5 year graduation rate has been 39.6% (an increase of 13.6%). Six and seven year graduation rates show minor increases to 40.6% and 43.35% respectively.

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	Retention									Graduation								
	Freshman Cohort	1yr	2yrs	3yrs	4yrs	5yrs	6yrs	7yrs	8yrs	~	1yr	2yrs	3yrs	4yrs	5yrs	6yrs	7yrs	8yrs
1997	75	82.7	73.3	62.7	32.0	16.0	5.3	2.7						22.7	38.7	44.0	45.3	46.7
1998	58	65.5	53.4	46.6	20.7	5.2		1.7					1.7	22.4	37.9	41.4	41.4	
1999	63	79.4	66.7	55.6	27.0	11.1	4.8						1.6	25.4	31.7	36.5		
2000	62	83.9	74.2	66.1	24.2	1.6								35.5	50.0			
2001	67	64.2	58.2	49.3	22.4									23.9				
2002	76	76.3	64.5	59.2														
2003	100	68.0	58.0															
2004	105	74.3																

5. Graduates (surveys) The Department has administered exit interviews for senior students for the past three years. Student feedback include requests for more career-related courses, a greater variety of courses, more career guidance, enhanced faculty assistance and concern, a more challenging curriculum and research opportunities. Overall, students report positive and negative experiences, but more on the positive side with respect to their experiences in the department. Many indicate a high satisfaction toward recent changes and new direction they have observed that the department is adopting.

6. Continuing Education and Employment: The Department of Biology does not have data on employment. Statistics on continuing education is summarized in the following table. For the past 5 years, the number of students continuing their education beyond the BS degree has been relatively low with a larger number entering MS programs as oppose to PhD or professional school. A significant number of Master's students entered PhD programs in 2001, but that number dropped significantly thereafter. This year, among the 31 BS degrees awarded in biology, only three students were admitted to dental school and 2 entered doctoral programs.

No. of Students Who Enrolled in Graduate and Professional Programs the Past 5 Years						
Undergraduates	2001	2002	2003	2004	2005	Total
Ph.D Programs	3		2	3	1	9
MS Programs	3	1	1	6	3	14
Professional School	2	1				3
Graduate Students	2001	2002	2003	2004	2005	
Ph.D. Programs	7		3			10

7. Results of Employer Surveys (Not available)

8. Evaluation of Student Experiences

Several instruments and mechanisms are used to evaluate student experiences. Students provide feedback on the classroom experience through the Student Opinions of Instruction Surveys. The Chairperson conducts Senior Exit Interviews to ascertain student opinions and observations of their four years in the department. Academic advisors are provided for all students to monitor performance and progress. The Department holds annual graduate retreats and freshmen orientation programs. Student experiences are observed through activities and participation in the Biology Pre-Health Club, the Biology Honor Society, seminars, symposia and internships.

IV. Faculty Development and Quality

A. Faculty personnel policies regarding appointment, promotion, tenure, merit salary increases on the basis of teaching, research and service are consistent with guidelines in the University's Faculty handbook. The chairperson completes evaluation of teaching, research and scholarly activity annually. Those recommendations are forwarded to the Dean of the College of Arts and Sciences for further review.

B. Faculty Profile

1. All faculty members in the Department of Biology have earned Ph.D. degrees.

2. Biology Faculty Rank and Tenure

	Rank	**Assistant Professors**	**Associate Professors**	**Full Professors**	**Total**
Non-Tenured	2	2			2
Tenure Track	3	1	2		3
Tenured	9		6	3	9
Total	14	3	8	6	14

3. Faculty Age Ranges

Age Group	30 - 39	40 - 49	50 - 59	60 - 69	Total
Frequency	1	2	7	4	14

4. Faculty Sex and Race

Sex	Africa American	White	Other	Total
Female	5	2	1	8
Male	3	3		6
Total	8	5	1	14

V. Progress Toward University's Mission

A. Access (past 3-5 years)

1. Enrollment patterns (Age, Sex Race) (2002 – 2005)

The total number of undergraduate Biology students has consistently increased from 207 in 2002 to 300 in 2005.

Undergraduate Enrollment by Sex

Fall	2002	2003	2004	2005
Undergraduate Females	152	189	212	222
Undergraduate Males	55	60	69	78
Total	207	249	281	300

This increasing trend is evident for both male and female undergraduate students, with female students (222 in 2005) numbering almost three times the male students (78 in 2005). The Biology department continues to have, on average, about 19 graduate students; 85% female and 15% male.

Graduate Enrollment by Sex

Fall	2002	2003	2004	2005
Graduate Female	17	14	18	15
Graduate Male	6	2	3	3
Total	23	16	21	18

The majority (95%) of biology majors are African Americans, with white and other ethnic groups makings up the remaining 5%. Graduate students are almost all African American.

Undergraduate Enrollment by Race/Ethnicity

Fall	2002	2003	2004	2005
Undergraduate Black	196	235	269	285
Undergraduate White	3	2	4	5
Undergraduate Other	8	12	8	10
Total	207	249	281	300

Graduate Enrollment by Race/Ethnicity

Fall	2002	2003	2004	2005
Graduate Black	20	15	19	17
Graduate White	3	1	2	0
Graduate Other	0	0	0	1
Total	23	16	21	18

3. Enrollment in degree-credit distance learning (N/A)

4. Awarding of Degrees by Level

A record number of undergraduate degrees (31) were awarded in 2005-2006, during prior years, the number of students graduating have typically been about 20 students, with a record few in 2002-03 (13). On average, about three students have been eligible for MS degrees per year, with only 1 and two students receiving their graduate degrees during 2005 and 2006 respectively.

Number of Students Graduating Over the Past 5 Years					
	2001-02	2002 -03	2003-04	2004-05	2005 -06
Undergraduates	19	13	20	20	31
Graduate Students	4	5	6	1	2

B. Faculty Development (Description of Activities past 3-years)

1. Discovery (Organized Research)

Number of Grant Applications and Awards for Past Three Years				
Number of	2003-04	2004 -05	2005-06	Total
Applications	13	18	19	50
Awards Received	$4,520764	$492,336	$172,000	$5,185,100
Pending			$7,935,546	$7,935,546

2. Engagement (Public and Community Service)

Scholarly and Public Service Activities				
	2003-04	2004 -05	2005-06	Total
Faculty Publications	11	8	12	31
Faculty Presentations	10	21	31	62
Faculty Workshops/Conferences	49	65	60	174
Public Service Activities	14	11	6	31
Faculty Awards/Honors/Fellowships	7	10	20	37
Departmental Seminars/Workshops	14	16	17	47

C. Interdisciplinary Activities

The faculty and students in the department of biology participate in many interdisciplinary programs and activities, including, but not limited to 1) the Annual Life and Physical Sciences Research Symposium, 2) program development and grant writing with other departments, 3) research collaborations, 4) undergraduate and graduate training programs, 5) the Interdisciplinary MS program in Computational Science and Engineering and the Ph.D program in Environmental Studies, 6) the Waste Management Institute, 7) the Public Health Institute 8) the University Research Clusters, and 9) University Studies.

VI. Analysis and Summary of Data

A. Strengths

The Department of Biology operates by shared governance with the faculty, through a set of standing committees that make recommendations to the Chairperson and Associate Chairperson. The growth, strength and advances in the Department of Biology are guided by the sharing and exchange of ideas between all of its stakeholders, students, staff, faculty, alumni and friends, and strategic partnerships on and off the campus. To facilitate dialogue between the various contributors, the Department sponsors faculty retreats, student orientations, graduate retreats, advisory board meetings, alumni receptions, conferences, symposia, meetings and a variety of feedback mechanisms. Through this approach the Department is rapidly increasing the excellence of its faculty, staff, and curriculum offerings, and raising expectations for scholarships and community outreach. Consequently, the Department has been very productive

in conducting a number of activities over the past three years that support FUTURES-related themes and goals. It has developed distinctive programs, strategic partnerships, and enhanced resources, responded to a more learning centered environment and made first steps in globalizing the departmental programs.

B. Trends

There are many positive trends that can be noted for the Department over the past three to five years. The department attracts a large number of potential majors each year and the enrollment has steadily increased over the past five years. The number of students participating in summer internships is on the rise. The increase in research faculty and enhanced research infrastructure is fostering more opportunities for students to acquire research experiences on campus during the academic year. The number of faculty participating in developmental activities and grant writing is also increasing as well as their participation on interdisciplinary collaborative research teams. To facilitate faculty and student development and to build a strong research culture, the Department has been offering a record number of scientific seminars, workshops and an annual symposium. As a result of increased grant award success over the past three years, the Department has strengthened its capacity to support faculty and student development and travel to local, regional and national seminars, conferences and workshops. The faculty is gradually distinguishing itself by serving on review panels for journals, books and funding agencies at local, state, and national levels, presenting papers at scientific conferences and publishing research in peer-reviewed journals. Over the past two years the Department has established a distinguished Alumni Advisory Board to support the department monetarily as well as with fundraising, curriculum development, motivational speeches and shadowing opportunities. It continues to raise funds for the Williams-Mack $1 Million Endowed Scholarship Campaign – the first scholarship fund established specifically for the Department of Biology from faculty, staff, private, and corporate donations. To further support students, faculty members have increased their participation in collaborative efforts to write interdisciplinary training grant applications to several federal agencies over the past three years.

In contrast to all of the observed positive movements, the Department recognizes a few negative trends which it is working diligently to reverse. The Department would like to increase the number of students who are well prepared to meet the requirements of a challenging and rigorous biology program; enhance the number of competitive students that earn BS and MS degrees in biology each year; and increase the number of majors who qualify for and enter graduate and professional schools.

B. Challenges and Potential Solutions

1. Although the Department of Biology has expanded in scope and activities, it continues to be limited by less than adequate facilities and research infrastructure. In the fall of 2006, the Department will relocate to Hines Hall and Barnes will be renovated. However, these renovations will decrease the usable space in Barnes Hall by 3,000 square feet. This will exacerbate the problem of the existing limited space in the Department for research and teaching, unless permanent space is acquired in Barnes Hall for new and existing faculty in the near future**.**

Solution: The Department has proposed that at least a new annex be added to Barnes Hall, or that the departmental research be retained in Hines Hall after the renovations to Barnes are completed.

2. Recruiting highly competitive students that have the potential to successfully complete the biology major in 4 years and continue their education in graduate or professional degree programs.

Solution: To recruit the best students for the biology major, the Department recognizes the need for a scholarship fund. Therefore, the Department of has launched a five-year one million dollar endowment. The Department is also aware of the need to enhance recruitment efforts and to enhance the distribution of high quality publicity materials (website, brochures) to attract a higher caliber of students. Other proposals include raising the enrollment standards and revising the curriculum to incorporate tracks and courses that better prepare students for careers of interest.

3. As the Department moves forward to revise its curriculum to include more molecular-based technology, it faces the challenge of not having enough resources to implement a higher quality program. The current operational budget for the department is not where it should be to offer its students a competitive educational experience and to support increases in enrollment.

Solution: To supplement the State resources for the Departmental operational budget, the faculty are seeking additional resources through training grants and student support on research grant applications. In addition, the Department continues to appeal to the administration to increase its allotment to the biology program.

4. Although the scholarly activity of the biology faculty has increased substantially over the past three year, the numbers of faculty publications in peer reviewed journals and the number of research grants are areas that need tremendous improvement.

Solution: Implement creative ways to release faculty members during the academic year to allow them to devote more time to research activities. Reduce course loads or service expectations by employing team teaching strategies and by using laboratory teaching assistants. Also the University could support academic year sabbaticals. The faculty can also help each other by engaging in collaborative grants and research activities.

D. Discuss analysis of 3-5 years enrollment trends in department/program

The number of freshman entering the program has consistently increased to over 300 since 2003. However, too many of the students enrolling in biology are not well prepared to meet the requirements of the program. This in turn impacts retention and graduation rates. Although the enrollment in the undergraduate program is high, the MS program enrollment has been consistently low for the past 5 years and graduation rates have declined significantly. The Department is optimistic that this trend will be reversed in the near future in concert with the influx of new faculty, a stronger emphasis on research, improved infrastructure for research, new

MS program directions, scholarship and research grant support. All of these factors will allow the Department to publicize and recruit highly qualified students with greater enthusiasm and vigor.

E. Discuss analysis of retention trends in department

For freshman cohorts entering in years 1997 through 2004, the average 1 year retention has been 74.3%. After 4 years, the average retention has been declining to 25.26 %. To assist as many of these students as possible to be successful in the major, the Department has been taking several steps to provide academic support through 1) innovative instruction in the first year course, 2) a formal academic advising system, 3) student retreats, 4) supplemental instruction, and 5) tutoring and peer advising. The Department is also proposing to increase the biology enrollment requirements as a strategy to recruit students who are better prepared to succeed in biology.

Form A

North Carolina A&T State University

Department/School Name: Biology

Program Name: Bachelor of Science in Biology

Program-Level Student Learning Goals

Please use this form to list the student learning goals for all programs in your department/school or attach a list. Use a separate sheet for each program and note that you may have fewer or more goals than space is allotted for here. If needed, make copies of this form.

1. Demonstrate knowledge of biological concepts and principles, the value of the scientific enterprise and the methods of science
2. Demonstrate the ability to think critically and cognitively
3. Demonstrate effective communication skills in writing and oral presentations
4. Demonstrate the ability to work effectively as a member of a team to analyze and solve objective problems in the sciences
5. Demonstrate professionalism, scientific integrity and ethical behavior
6. Demonstrate a higher level of competency on standardized examinations
7. Demonstrate ability to integrate computational skills and biological concepts
8. Demonstrate skills and understanding of basic laboratory techniques in biology
9. Demonstrate ability to analyze scientific data, interpret experimental results and formulate theories to advance the scope and breadth of biological science knowledge

Other Program Outcome Goals*: such as job placement, graduate school enrollment, success on licensing exams; development of workplace skills such as dependability, initiative, leadership, group-working skills; commitment to citizenship; program satisfaction, persistence and time to degree, etc. Be specific, e.g., "At least one-fourth of each graduating class will apply to graduate school".*

1. At least twenty-five percent of each undergraduate will gain entry into doctoral level programs in the biological sciences.
2. At least 25% of .B.S. graduates will successfully matriculate into health professional programs.
3. All B.S. graduates will obtain employment consonant with the skills, applications, and knowledge base acquired during their matriculation in our program.
4. At least 50% of the undergraduate majors in biology will complete the BS degree program in 4 years.

Form B

North Carolina A&T State University

Department/School Name: Biology

Program Name: Bachelor of Science in Biology

Evaluation Methods

List methods (qualitative and/or quantitative) and whether these will be used again.

Commercially Developed Methods	
Graduate Record Examination (GRE)	Applies only to students who plan to enter graduate school. (continue)
Medical College Admission Test (MCAT) Some of our students are expected to enroll in medical school after completing the BS. degree	Required for students planning to enroll in medical school (continue)
Dental Admission Test (DAT) Some of our students are expected to enroll in dental school after completing the BS. degree	Required for students seeking admission to dental school. (continue)

Form C

North Carolina A&T State University

Department/School Name: Biology

Program Name: Bachelor of Science in Biology

Evaluation Methods

List methods (qualitative and/or quantitative) and whether these will be used again.

Locally Developed Methods	
One hundred percent of biology majors will enroll in specific courses (BIOL 101, 160, 221, 240, 260, 401, 410, 462, 466, 501 (Capstone), 561) in which writing, research, analysis and interpretation of biological and related literature and data are required. One hundred percent of biology B.S. students will complete required courses by passing with a grade of "C" or better. (Goals #1-7)	Regular and routine course examinations (continue)
Course assignments involving the development of laboratory skills One hundred percent of biology undergraduate students will complete course assignments that have a laboratory component and earn a grade of "C" or greater. (Goal #8)	(continue) Observations by instructors
Comprehensive Final Examinations are required in all biology major courses to assess retention, overall comprehension, and applicability of course information. (Goals 1-4,7,8)	This includes regular and routine course examinations, research presentations, evaluation of research articles in the scientific literature.
A Senior Project (research experience) is a new requirement for graduation. It has been incorporated into the curriculum as the senior Capstone course for all new students entering the biology program in fall 2006 and thereafter. (Goals 1-5, 8,9)	This is the department's mechanism for providing a culminating Capstone experience in research

Form D

North Carolina A&T State University

Department/School Name: Biology

Program Name: Bachelor of Science in Biology

Major Findings and Changes Made to Program(s) as a Result of Assessing Goals

Please list the major findings and program improvements made as a result of assessing student learning and program outcome goals. Link the findings to the method used.

Findings: (1) Students need to improve writing skills (2) Insufficient scholarship funds are available to attract well prepared students (3) Retention and graduation rates are low (4) Students need more experience with the application of math in biology (5) More students need a research experience

Program Improvements: (1) The Department has revised the advising program and initiated exit interviews to help in assessing the needs of students (2) More highly qualified students are being recruited through faculty efforts. (3) The Department launched a million dollar endowed scholarship fund (4) Additional computationally intense courses have been added to the course offerings (5) Interdisciplinary faculty teams have submitted grant proposals to establish computational student research (6) Supplemental instruction has been made available for students needing help in mathematics courses (7) The Capstone course with a focus on a research experience has been established (8) Faculty have increased more demanding writing requirements in upper level courses (9) Instructional delivery using information technology has been enhanced with support of a Change Agent, Dr. Gregory Goins who was hired to integrate technology into biology courses.

Form A

North Carolina A&T State University

Department/School Name: Biology

Program Name: Masters of Science in Biology

Program-Level Student Learning Goals

Please use this form to list the student learning goals for all programs in your department/school or attach a list. Use a separate sheet for each program and note that you may have fewer or more goals than space is allotted for here. If needed, make copies of this form.

1. Demonstrate the ability to read the scientific literature, to identify gaps in the knowledge, and to apply the knowledge gained from the literature to their research projects.
2. Demonstrate the ability to think critically and cognitively.
3. Demonstrate effective skills in writing and oral presentations.
4. Demonstrate the ability to work effectively as a member of a team and to work independently with limited guidance.
5. Demonstrate competencies essential for the teaching of specific biological concepts and laboratory techniques in undergraduate classes.
6. Demonstrate a wide breath of knowledge in multiple scientific disciplines.
7. Demonstrate an ability to propose experimental designs based on hypothesis-driven research.
8. Demonstrate professionalism and scientific integrity.
9. Be prepared to demonstrate competency on standardized examinations.

Other Program Outcome Goals*: such as job placement, graduate school enrollment, success on licensing exams; development of workplace skills such as dependability, initiative, leadership, group-working skills; commitment to citizenship; program satisfaction, persistence and time to degree, etc. Be specific, e.g., "At least one-fourth of each graduating class will apply to graduate school".*

1. At least twenty percent of graduates will enter doctoral level programs in the biological sciences.
2. At least 50% of .the graduate students will complete the M.S. degree in two years.

Form B

North Carolina A&T State University

Department/School Name: Biology

Program Name: Master of Science in Biology

Evaluation Methods

List methods (qualitative and/or quantitative) and whether these will be used again.

Commercially Developed Methods	
Graduate Record Examination (GRE) One hundred percent of M.S. students are required to take the GRE before full admission to the program (Students may be admitted conditionally or provisionally until GRE requirement is satisfied.) (This is a School of Graduate Studies admission requirement).	Required of each M.S. student before full admission to the program (Students may be admitted conditionally or provisionally until GRE requirement is satisfied.) (continue)
Medical College Admission Test (MCAT) Some of the M.S. students are expected to enroll in medical school upon completion of the M.S. degree	Recommended for students seeking admission to medical school. (continue)
Dental Admission Test (DAT) Some of our students are expected to enroll in dental school after completing the M.S. degree	Recommended for M.S. students seeking admission to dental school. (continue)

Form C

North Carolina A&T State University

Department/School Name: Biology

Program Name: Master of Science in Biology

Evaluation Methods

List methods (qualitative and/or quantitative) and whether these will be used again.

Locally Developed Methods	
Enrollment in specific courses (BIOL 701, 702, 703, 749, 862 Thesis I and 863-ThesisII) in which an advanced level of writing, research, analysis and interpretation of biological and related literature and data are required. One hundred percent of biology M.S. students will complete required courses, passing with a grade of "B" or better. (Goals #1-9)	Regular and routine course examinations, research presentations, evaluation of research articles in the scientific literature (continue)
Course assignments involving critical analysis of biological and graphical data of primary and secondary sources for specified courses. One hundred percent of biology M.S. students will complete course assignments, requiring advanced skills in critical thinking, analysis, and interpretation of data, earning a grade of "B" or greater. (Goals #1-9)	(continue)
Course examinations for specific courses. One hundred percent of biology M.S. majors will pass examinations with a grade of "B" or better. (Goals #1-9)	Regularly scheduled (continue)
Comprehensive Examination One hundred percent of biology M.S. majors will	(continue)

pass the comprehensive examination. (Goals #1-9)	
Thesis One hundred percent of M.S. students choosing this option will complete a thesis that demonstrates an advanced level of pedagogical and thematic subject matter and that demonstrates proficiency in writing and a grasp of primary research presentation. (Goals #1-9)	Required of students choosing this option (continue)
Alumni surveys/questionnaires to ascertain the success of the department's graduates in finding employment and enrolling in graduate or professional programs (Goals #1-2: Other Program Outcomes)	Administered every three-five years (continue)
Exit interviews with graduating students One hundred percent of graduating students will be interviewed to determine satisfaction with program and preparation for post-graduate employment or education. (Goals #1-2: Other Program Outcomes)	Administered to each graduating class (continue)

Findings and Changes Made to Program as a Result of Assessing Goals

Form D

North Carolina A&T State University

Department/School Name: Biology

Program Name: Master of Science in Biology

Major Findings and Changes Made to Program(s) as a Result of Assessing Goals

Please list the major findings and program improvements made as a result of assessing student learning and program outcome goals. Link the findings to the method used.

Findings: Students are unable to complete the program in less than three years. (1) An inadequate number of research advisors are available in the Department. (2) Insufficient scholarship funds are available for students. (3) Student show a lack of understanding the graduate process, including reading primary literature, selecting research advisor, writing research proposals.

Program Improvements: (1) The annual graduate retreat has been established to assess needs of students and to inform students of about the graduate process. (2) The graduate seminar course was revised to include proposal writing experience. (3) The Department has hired 4 new faculty members with strong potential to establish research program on campus. (4) Students are supported by various funding mechanisms including teaching assistantships, BRIDGE programs with the University of North Carolina Chapel Hill, North Carolina State University and Georgia State University, and Title 3 support.