



## **Instructional Program Review Summary 2005 - 06**

Instructional Area: Math/Science

Department: Biology

Discipline: Biology

November 10, 2006

## Instructional Program Review Summary

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NOTE: An external reviewer should not be required to refer to the documentation notebook to understand the Instructional Program Review

Summary. Rather, data should be clearly cited in the summary so that the reviewer can easily find the source documents if needed.

### **EXECUTIVE SUMMARY**

Use the following guidelines to provide a concise overview/summary of the program review contained in this report.

Write a brief description of the goals and objectives of the discipline.

1. To prepare biology students with fundamental biological skills and knowledge needed to transfer to another institution.
2. To provide general education that prepares students to think critically and apply their knowledge of biological sciences to problems and concerns facing our society.
3. To prepare students with fundamental biological skills and knowledge needed to enter and succeed in a workforce program/certificate

Overview of how the program review was conducted. The program review was conducted by a committee of twelve individuals who researched ACC records and data resources, sought community input, and gathered data from full-time and adjunct faculty, staff and students through email questionnaires.

Summary of findings:

Progress on previous program review recommendations.

1. Standardize biology course content across all campuses:
  - 1.1 Common course objectives were developed, approved, implemented, and reviewed by the department.
  - 1.2 Equipment availability and usage were compared, equipment availability was adjusted, and equipment was ordered, received and delivered to correct deficiencies as funds were made available.
  - 1.3 College-wide safety procedures were developed, implemented, and are being enforced.
  - 1.4 Lab manuals were developed for courses taught college-wide for which no lab manuals were available.
  - 1.5 A three-year budget plan for equipment purchases was developed and implemented. Equipment was purchased as funds were made available to the department.
2. Expand study opportunities for biology students at all campuses.
  - 2.1 Open study lab opportunities are made available to students on a space-available basis and open study lab hours are announced and published. Some open study lab hours are available at every campus where BIOL 2304 anatomy and BIOL 2404 are taught. However, due to the increased number of sections offered at these campuses, open lab hours are severely limited and are usually restricted only to Friday time slots and some Saturday hours. Students are provided with a college-wide schedule for open study lab

opportunities at all campuses. Due to lack of space and funding, open study hours are not available for most other biology classes.

2.2 An anatomy tutor is available during open lab hours at every campus for a few hours per week during fall and spring. An anatomy tutor is available during the summer only at RVS and RGC. The tutoring location and schedule are announced and published each fall and spring semester.

2.3 Peer tutors and student study groups have been organized when and where student interest and willingness to participate made this possible. However, there has been limited participation due to student schedule conflicts. Space is a limiting factor, since the student study groups have very limited access to lab materials.

3. Expand the biology infrastructure to provide more support for adjunct and full-time faculty.

3.1 Adjunct and New Faculty Orientation is provided every fall and spring semester.

3.2 Specific subject-related workshops are offered in conjunction with faculty orientation sessions, and safety workshops are provided every year to accommodate certification requirements for faculty and staff.

3.3 Focus groups for full-time and adjunct faculty who teach the same courses are held in conjunction with faculty orientation sessions.

3.4 The departmental Adjunct Faculty Handbook is updated annually and a copy is provided to each biology faculty member.

4A. Explore ways to increase student retention and success in BIO 1714.

4A.1 BIO 1714 and BIO 1724 have been discontinued and replaced by BIOL 2304/2101 and BIOL 2305/2102 in order to comply with requirements of the Common Course Numbering System enforced by the Texas Coordinating Board for Higher Education.

4A.2 Assessment exams were developed and are required for enrollment in BIOL 2304 and BIOL 2305, and continuing education courses for reviewing exam topics are offered prior to the exams. As a result of the assessment exam prerequisite, student retention and student success in these courses have increased significantly, with a much lower withdrawal rate.

4B. Explore ways to increase student retention and success in BIOL 1406.

4B.1 The biology faculty agreed upon common course objectives for BIOL 1406. In addition, a college-wide lab manual was prepared for use in all classes. This has standardized course content college-wide.

4B.2. Assessment testing has been discontinued for BIOL 1406. The biology department has looked at other assessment measures, including pre-post tests. However, nothing has been implemented to date.

4B.2 Discussion is ongoing regarding topics to be included in the final unit of BIOL 1406. There is also discussion about adding new lab exercises to make the course comparable in content to similar courses taught at other institutions.

5. Develop a plan for managing the projected growth of the biology program.

5.1 In addition to the existing traditional classroom sections and the ITV sections in BIOL 1309, 1323, and 2306, PRN sections were developed and offered in BIOL 2106,

2206, and 2406; and PCM sections were added in BIOL 1309, 1406, 1408, 2304, 2306, 2316, 2321, and 2420.

5.2 Botany and Native Plants were offered at the Lady Bird Johnson Wildflower Center on a limited basis. These sections are no longer offered because the Wildflower Center no longer has available space for ACC classes in their facilities.

5.3 Supplies and Equipment needs and lab facilities needs were developed for the South Austin Campus.

6 Evaluate Open Campus offerings to determine the extent to which biology courses meet student needs.

6.1 ITV, PRN, and PCM sections of biology courses continue to be in great demand.

6.2 Class size and loading for OPC courses are determined by a college-wide committee which has considered these issues recently and has reported their conclusions to the department, basically without change.

6.3 In response to student demand, most of the biology courses offered by Open Campus are changing from ITV mode to PCM mode.

6.4 The department will continue to request additional Open Campus sections to meet increasing student demand for these sections.

7. To train biology faculty to understand, implement and assess basic skills involved in problem-solving and critical-thinking in their classrooms.

7.1 Workshops in the use of case studies and other problem-solving activities have been provided for the biology faculty.

8. To request additional budgetary funds to purchase microscopes, additional technological materials and other capital equipment to use in biology classes, especially laboratories.

8.1 High priority capital equipment items have been identified and appropriate funds have been requested every year.

8.2 Many high priority capital equipment items, including microscopes and laptop computers have been funded, purchased and delivered. Currently, every biology lab have good microscopes for student use.

8.3 When funds have not been made available for high priority capital equipment items, those items have been moved up in order of priority for succeeding budget years.

**Program strengths.**1) Clear common course objectives for all biology courses which help ensure that the same core material is covered by all faculty

2) Wide diversity of biology course offered

3) Highly qualified faculty who are highly motivated about teaching biology

4) Newly hired biology faculty have increased the diversity within the department.

5) Faculty are responsive to changing curriculum needs and implement new technologies (both teaching strategies and laboratory experiments)

6) Excellent support staff, including lab assistants and administrative assistants

7) Comparable equipment and supplies in every biology lab across the college

8) Good rates of student transfers to other institutions

- 9) Biology labs available at multiple campuses, with courses taught at many different locations, times and days of the week
- 10) Good safety standards in laboratories

Areas for improvement.

- 1) Inadequate number of lab assistants and support staff.
- 2) Inadequate funding for consumable instructional supplies as new sections are continually added to the schedule
- 3) Obsolete classroom technology at many campuses
- 4) No college-wide plan for replacing equipment as it wears out
- 5) Insufficient lab equipment at outlying campuses, especially FBG
- 6) Lack of wireless capabilities in our classrooms and laboratories
- 7) Lack of computer equipment in laboratories. Some campuses do not have computers or internet access in the laboratories for student use.
- 8) College-wide lack of biology tutors
- 9) Inadequate time and space available for open lab study by students

Key planning issues.

- 1) The BIOL 2304/2101 and BIOL 2305/2102 assessment tests are a current headache for the department. The department needs to implement new testing procedures and revise the different assessment tests. We also need to explore different ways of helping students prepare to take these exams.
- 2) The department is still short on faculty and staff.
- 3) Biology labs still need additional equipment. Some laboratories have more and better equipment than others.
- 4) The department needs to evaluate its current course offerings and course content.

Conclusions: What are the major conclusions regarding the present state of the program?

The biology department is doing the best it can to prepare our students for their future careers and educational pursuits with the resources that are available to us. We are understaffed, particularly with regards to lab assistants. As more biology sections are added to the schedule without additional funding, the department is underfunded with regards to consumable supplies and equipment under \$500. Although we have been attempting to equalize resources at the different campuses for the past four years, we have been limited by inadequate funding. As a result, resources are not comparable at all campuses where biology labs are taught.

Recommend future directions for the program based on this review:

- Expand services
- Maintain services
- Reduce services

Close program

Recommendations: Summarize the self-study's recommended actions for improving the quality of the program.

- 1) Review the BIOL 2304/2101 and BIOL 2305/2102 assessment tests and make revisions as needed
- 2) Try to find a way to implement online testing for the assessment tests with rapid feedback to students
- 3) Explore new ways to prepare students for the assessment tests
- 4) Hire more full-time faculty to teach high-demand biology classes
- 5) Review equipment in all biology labs and continue to work toward having comparable lab facilities at all campuses
- 6) Review common course objectives periodically
- 6) Compare our biology course content to other institutions and revise as necessary

### SELF-STUDY TEAM PARTICIPANTS

List the names of people who participated in the review and their association with your program.

- |   |   |  |
|---|---|--|
| Name Alice J. Sessions<br><input type="checkbox"/> Student  | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Suzette D. Mathis<br><input type="checkbox"/> Student  | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Laura Juarez de Ku<br><input type="checkbox"/> Student | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Steven J. Muzos<br><input type="checkbox"/> Student    | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Charles R. Wayne<br><input type="checkbox"/> Student   | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Steven W. Ziser<br><input type="checkbox"/> Student    | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name David Froehlich<br><input type="checkbox"/> Student    | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Stephen Greene<br><input type="checkbox"/> Student     | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |
| Name Les Albin<br>Student                                   | <input checked="" type="checkbox"/> ACC Faculty | <input type="checkbox"/> Industry Representative |

### PROGRAM DESCRIPTION

Provide a brief description of the overall history, major developments and current objectives for your program (limit to 500 words).

The biology department started at one campus (Ridgeview) when the college first opened. As the college has grown and added new campuses, the biology department has also grown and expanded into all ACC campuses, with courses also being offered at Fredericksburg and Harper High School. The biology department also was one of the first departments to offer Open Campus classes and has continued to add additional biology courses whenever possible. The biology department has two areas of focus with regard to course offerings: (1) for transfer students (both majors and non-majors) and (2) for students preparing for workforce programs.

### STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS (SWOT)

List the names of people who participated in the SWOT and their association with your program.

Name Les Albin  ACC Faculty  Industry Representative  
 Student

Name Laura Juarez de Ku  ACC Faculty  Industry Representative  
 Student

Name Steve Ziser  ACC Faculty  Industry Representative  
 Student

Name Lorna Shepherd  ACC Faculty  Industry Representative  
 Student

Name Camille Clay  ACC Faculty  Industry Representative  
 Student

Name Stephen Greene  ACC Faculty  Industry Representative  
 Student

Name Patricia Phelps, Suzy Mathis, Alice Sessions, David Froehlich   
ACC Faculty  Industry Representative  Student

Summarize the findings of the SWOT analysis. Focus on the top 5 or 6 issues and answer the following questions:

**Strengths:** In what does your program excel?

1. Clear common course objectives used by all faculty
2. Well-qualified and diverse body of faculty that are highly motivated and devoted to teaching biology
3. Excellent support staff, including lab assistants and Mark McCaffery, administrative assistant for math/science
4. High academic standards and student oriented instructional philosophy
5. Good rates of student transfer and good student success after transfer
6. Biology courses available over a wide geographic area and available at a wide range of times and days of week
7. Emphasis on lab safety and safety training.

**Weaknesses:** What are the aspects of your program, which, if not addressed, will impede the area's future?

1. Inadequate support staff and lack of resources for improving instructional quality
2. Out of date classroom technology and obsolete lab equipment
3. Wide geographic area creates difficulties with faculty and staff moving from campus to campus in a timely fashion.
4. Need additional opportunities for faculty development in the content area
5. Lack of time and funding for curriculum development

6. Insufficient opportunities to network with colleagues on different campuses
7. Students are increasingly unprepared for college-level work. Without adequate tutoring facilities available, many biology students withdraw from the courses or are unable to succeed.
8. There is an overall lack of space provided for the biology department needs, specifically:
  - a. Inadequate prep room and storage space
  - b. Inadequate lecture rooms, forcing many biology lectures to be held in lab spaces.
  - c. Inadequate lab space, especially at some campuses (RGC)
  - d. Insufficient lab time available to allow students to study lab materials outside of the scheduled lab times.
9. Some campuses lack basic safety equipment, such as eye wash stations and safety showers in the lab rooms.

**Opportunities:** What factors does your program need to take advantage of in order to enhance the quality of the area?

1. As new campuses are added to the college, the biology department needs to work with the administration to add biology courses and ensure adequate lab facilities and equipment are available at the new campuses.
2. The biology department should encourage the faculty to use internet activities and to incorporate new technologies into the curriculum whenever possible.
3. The biology department should apply for grant funding.
4. The biology department could investigate possibilities for developing CE for teachers.

**Threats:** What are the external factors that could negatively impact your program's future?

1. Inadequate funding for equipment.
2. Inadequate funding for new faculty and new lab assistant positions
3. Increasing costs and insufficient financial aid may reduce the number of students who can afford to attend ACC
4. Inadequate release time and compensation for the department head position.

Discuss changes from the program's previous SWOT analysis.

In the previous SWOT, safety was identified as a major concern for the department, especially inadequate safety training and lack of college-wide safety policies. Both the department and the college have made great strides in implementing safety training and establishing safety standards. The biology department has a full-time faculty member (Sarah Strong) who is the safety officer for biology. Safety training is done on a regular basis for all faculty and staff in the department. Many of the administrative problems identified in the previous SWOT are still present, specifically insufficient resources which are even more thinly spread out among the various campuses. On the other hand, the department has conscientiously made an effort to increase communication among the biology faculty and staff. The department has a website and a listserv that is used by all biology faculty and staff to communicate about college-wide issues. Regular adjunct

meetings are held at the beginning of fall and spring to encourage a sense of community and to allow networking opportunities. The lack of student preparedness, insufficient tutors, study labs, technology and equipment have not changed since the previous SWOT.

## **ANALYSIS**

### **[a] Relevance of the program to College mission and desired ends**

#### **Mission:**

Review the program's purpose statement. Verify that the statement is current and accurate and reflects the mission of the college as a whole or update the purpose statement.

The Self-Study team reviewed the program purpose statement and found (select one):

The purpose statement is current, accurate, and reflects the mission of the college. Enter the program's purpose statement:

- (1) To prepare biology majors with the fundamental tools required to allow them to successfully transfer and complete a baccalaureate degree in biology
- (2) To provide general education that prepares students to critically apply their knowledge of the biological sciences to the problems and concerns facing our society.
- (3) To prepare students with the fundamental tools required to allow them to successfully enter and complete a workforce program or certificate.

The purpose statement was revised as shown below (enter the revised purpose statement):

### **Intended Outcomes (Board Policy A-2. Intended Outcomes)**

How well does the program support the intended outcomes of the college to "ensure a quality return on the public's investment in its community college district?"

The biology department strives to offer a variety of biology courses at different campuses, different times and by different modes of delivery. The faculty work together to update the curriculum and keep the courses current and relevant. Courses that do no longer have a Common Course Number are deleted from the curriculum. The faculty review course content from other institutions to ensure that our program is equivalent.

In what ways does the program encourage students to become lifelong learners?

The biology department emphasizes critical thinking skills and problem solving skills in all courses. These skills apply to all aspects of life. In addition, we teach students to use a variety of resources to supplement the lecture and lab components, including internet assignments, papers, projects, speeches, Power Point Presentations, case studies and current events.

In what ways does the program provide accessible and affordable services for all who qualify and have the ability to benefit?

The biology department offers many biology courses by open campus as well as through traditional lecture/lab based courses. We offer biology classes at all ACC campuses, in addition to Fredericksburg and Harper High School sites. We schedule at least one biology course in fall and spring on the weekend.

In what ways does the program achieve enrollments reflecting the diverse and traditionally underserved populations in numbers that mirror the local populations of our Service Area?

The biology department offers a variety of courses to try to meet the needs of many different students. Some biology courses are specifically targeted for science majors who intend to transfer to other institutions. Some biology courses specifically target non-science majors who need to fulfill science requirements for graduation in a non-science program. We offer a variety of courses that fulfill these core curriculum requirements and still provide students with choices of course content and mode of delivery. Other biology courses target students who intend to enter an allied health career and need specific biology courses to meet prerequisites of their intended programs. In Fall 2004, 35.4% of all biology students were non-white, which is comparable to the overall college average of 39.6%. 69% of the biology students successfully passed their biology courses with a grade of A, B, C or D, which is comparable to the college-wide average of 69%.

In what ways does the program promote achievement of students' educational goals, student retention, and program completion?

In order to help improve the success rates for the diverse and underprepared students enrolled in Capital Ideas, the biology department has worked closely with Capital Ideas to help their students succeed in their anatomy and physiology courses. Space is provided at the RVS campus on Friday for special tutoring in both lecture and lab. Biology faculty are paid through Capital Ideas to run these tutoring programs, which have remarkably increased the success rate of these students.

In what ways does the program achieve student performance that meets or exceeds state and national benchmarks in transfer to universities, job placement into family-wage careers, retention and completions, basic skills acquisition, literacy level increases, and successful transition from developmental to college-level courses?

The biology department offers courses that comply with the Common Course Numbering System and the course descriptions provided by the Texas Coordinating Board for Higher Education. These courses transfer to all other Texas institutions and to many out-of-state institutions.

Based on Fall 2000-Summer 2001 data, the following declared majors transferred to other Texas Public Institutions:

300 out of 578 declared biology majors;

174 out of 431 declared Pre-Medical majors;

69 out of 129 declared Pre-Pharmacy majors;  
38 out of 166 declared Pre-Veterinarian majors; and  
24 out of 66 declared Pre-Pharmacy majors.

300 out of 578 declared biology majors successfully transferred to other Texas Public Institutions. 174 out of 431 declared Pre-Medical students transferred successfully. 69 out of 129 declared Pre-Pharmacy students transferred

In what ways does the program improve personal lives by advancing students toward further education or contributing to their ability to succeed in the workplace and be productive citizens?

The biology courses emphasize critical thinking skills and problem solving skills, which are applicable to all facets of life. In lab experiments, students are exposed to standard lab equipment, procedures and safety which also carry over into their careers. The use of technology in our courses also mirrors the use of technology in the lives of our students, both personally and in the work force.

In what ways does the program demonstrate efficient administration and services that avoid procedures that waste the money or time of students?

The funds available for our classes limit our opportunity to waste money or otherwise we would not be able to provide as many lab classes as we do. Our department tries to standardize lab activities across the college, so funds are not wasted and students get comparable experiences at the different campuses. Equipment is also standardized in the different biology labs, so we are not wasting money buying equipment and supplies that are not used. Classes that do not have sufficient enrollment are cancelled by the college at the beginning of the semester. Sections are only added if all sections of a course are full and there is available space and faculty to teach additional sections.

In what ways does the program contribute to creating an institution that is a good place to learn, work, and experience the higher education process?

The faculty and staff in the biology department are enthusiastic, knowledgeable and interested in student learning. Their passion about biology translates into enthusiasm in the classroom, which helps to create appropriate learning environments for our students.

Does the program assess and review its effectiveness each year and report its findings in the Unit Level Effectiveness Assessment Database (ULEAD)?

No. Since BIO 1714 is no longer taught at ACC, the assessment of this course was discontinued. The BIOL 1406 faculty have been unable to agree upon a methodology for assessing BIOL 1406 students, so the last assessment was given in Fall 2003.

**[b] Responsiveness to community needs and satisfaction of community demand**

In what ways does the program address a verifiable need for the student, community, and society?

During Fall 2001 – Fall 2005 the ACC Biology Department has shown a great deal of responsiveness to the needs of the students, the College, and the community.

In the state of Texas, all students seeking an undergraduate degree who are enrolled in a state sponsored college or university are required to take at least two Natural Science classes as part of their core curriculum. As of Fall 2005, 18 biology courses are part of the ACC core curriculum.

Biology is a major in its own right, and offers service courses for at least 62 ACC degree and certificate programs. Therefore, it is necessary for the Biology Department to offer a wide range of classes. The following items illustrate various ways in which the department has responded to these needs.

1. ACC offers 27 different biology courses.
2. Eighteen biology courses are part of the ACC Core Curriculum (BIOL 1309, 1406, 1407, 1408, 1409, 1411, 1413, 1424, 2101, 2102, 2106, 2206, 2304, 2305, 2306, 2402, 2420, and 2421).
3. Six of the core curriculum biology courses are offered through Distance Learning to ACC students (BIOL 1309, 1406, 1408, 2106, 2206, and 2306). Two other biology courses are also offered through Distance Learning (BIOL 1323 and 2406)..
4. At least six of the core curriculum biology courses (1406, 1408, 2101, 2102, 2304, and 2305) are offered on four or more of the major ACC campus (CYP, EVC, NRG, RGC, RVS, PIN).
5. Eighteen specific biology courses are required by 62 different ACC degree and certificate programs (Table 1).
6. Biology courses are offered at eight different ACC locations (CYP, EVC, FBG, HHS, NRG, RGC, RVS, and PIN) in addition to courses taught through Distance Learning.
7. At least one introductory course is taught as a weekend course during the fall and spring semesters.
8. The Study Guides for BOL 1309 and BIOL 2306, the Lab Manual for BIOL 1406, and one introductory lab for BIOL 1408 are available online for students. Several biology instructors maintain web pages for their students.
9. The Biology Department operates biology study labs at 4 or more campuses, depending on available faculty and staff. Many of the hours for these labs are monitored by faculty during their office hours due to a lack of funds for adequate staff positions.

10. Several biology courses require specialized facilities and equipment, and can only be offered at certain campuses. The equipment has been located in several campus locations to make it accessible to more students.

Describe the results of the program's most recent assessment of community need.

The department reviews and revises courses on a regular basis. This is also done if needs are brought to the attention of the department by a student, faculty member, another ACC department, another school, or the community.

1. Since Fall 2001, several biology courses have been renamed and/or renumbered (Table 2). Some of this has been in response to the department's compliance with the Texas Common Course Numbering System.

2. Some changes have been made in response to the needs of the Allied Health programs so that they can meet their certification requirements. The Biology Department has been very responsive to those needs.

BIO 1714 and BIO 1724 Anatomy and Physiology I and II (each 4-3-3), became BIOL 2401 and 2402 Anatomy and Physiology I and II (each 4-3-3). In addition, an entirely new course (BIOL 2404 Introduction to Anatomy and Physiology) was created to meet the needs of certain Allied Health Programs.

Due to the high demand for BIOL 2304 & 2101, BIOL 2305 & 2102, and BIOL 2404, and the department's desire to offer enrollment in the courses to those students who had adequate preparation, assessment tests for the necessary prerequisite information were developed. In order to ensure that students had basic knowledge of core science topics at the high school level needed to successfully complete these courses, students must pass the appropriate assessment test before they are allowed to enroll in those courses. Preliminary data suggest that the test results have a positive effect in identifying those students who need more preparation in order to be more likely to succeed in those courses. These courses continue to fill early during registration.

3. Some changes have also been in response to the needs of other programs.

BIOL 2477 The Theory and Use of Labs in Biology Education (4-3-3) was developed to meet the needs of high school biology teachers.

BIO 2614 Aquatic Biology, was developed for the Environmental Science and Technology certificate program. However, it has never been offered due to the lack of a Common Course Number.

4. HIGH DEMAND COURSES

The Biology Department typically offers fourteen biology courses that have classified as High Demand courses by ACC (Fall 2005). The department has added more sections of these courses whenever possible, in accordance with the ACC restrictions placed on the department concerning the total number of sections the department is allowed to offer. Overall, the department increased its section offerings of high demand courses by a total of 132 sections, which represents a 22.2 % increase in the number of High Demand sections offered from Fall 2001 to Fall 2005.

A comparison of students enrolled in High Demand biology courses indicates that an additional 409 students were able to enroll in these courses in Fall 2005 compared to Fall 2001. This represents an increase of 16.7 % during that time period. The department's response to student and community needs has had a positive effect in this area.

As for High Demand Distance Learning courses, more sections of BIOL 1309 and 2306 have been offered since Fall 2001. However, more students try to register for these classes than we are able to accommodate. In Fall 2005, 105 students were unable to register in these two biology courses. Students and faculty members regularly ask for more sections or increased enrollment in those DL sections offered. ACC policies about workloads and adding additional sections sometime inhibit the department's efforts to respond to student needs.

Most of the department's labs are already fully scheduled with classes, which limits the possible offering of more sections without expanding lab facilities. Due to safety issues, the class limits in lab-based courses cannot exceed specific limits. In Fall 2005, a total of 853 students were turned away from high demand classes, including the 105 students mentioned above.

**How do the program's five-year enrollment trends compare with those of the College overall?**

The biology department has been growing significantly faster than the college-wide academic courses as a whole. This is due to the addition of new biology sections to try to meet the increasing demand for biology classes.

1. In Fall 2001, biology faculty had 216,880 contact hours. In Fall 2005, biology faculty had 255,888 contact hours. This is an increase of 17.98%. In Fall 2001, all ACC Academic faculty had 3,018,000 contact hours. In Fall 2005, all ACC Academic faculty had 3,309,720 contact hours. This represents a college-wide increase of 10.26%.

2. In Fall 2001, the biology department taught 9,619 credit hours. In Fall 2005, the biology department taught 11,291 credit hours. This is an increase of 17.38%. In Fall 2001, all ACC academic courses taught 169,872 credit hours. In Fall 2005, all ACC academic courses taught 185,922 credit hours. This represents a college-wide increase of 9.44%.

3. In Fall 2001, the biology department had 2,575 students enrolled. In Fall 2005, the biology department had 3,357 students enrolled. This is an increase of 30.36%. In Fall 2001, all ACC academic courses had 53,970 students enrolled. In Fall 2005, all ACC academic courses had 59,170 students enrolled. This represents a college-wide increase of 9.63%.

**[c] Accessibility to students and identification of unnecessary barriers**

Analyze when and where courses are offered (by campus, time of day, mode of delivery).

Since the biology department teaches 27 different courses on six major campuses (plus FBG and HHS) and this form will not allow tables to be inserted., a data table listing courses offered by campus cannot be provided. The data table is in the attachments and a brief summary of which classes are taught by campus is below. Please refer to the next section for the number of biology sections taught by campus.

As of Fall 2004, the biology courses taught by campus were:

CYP: 6 courses (BIOL 1323, 2101, 2304, 2402, 2404, 2420)

EVC: 3 courses (BIOL 1323, 1408, 2316)

NRG: 4 courses (BIOL 1323, 1406, 1407, 1408)

PIN: 6 courses (BIOL 1408, 1409, 2101, 2304, 2402, 2404)

RGC: 11 courses (BIOL 1323, 1406, 1407, 1408, 2101, 2102, 2304, 2305, 2316, 2420, 2421)

RVS: 14 courses (BIOL 1322, 1323, 1406, 1407, 1408, 1409, 1411, 2101, 2206, 2304, 2306, 2402, 2404, 2420)

FBG: 3 courses (BIOL 2101, 2304, 2404)

HHS: 1 course (BIOL 1408)

OPC: 9 courses (BIOL 1309, 1323, 1406, 1408, 2106, 2206, 2306, 2402, 2406)

As of Fall 2004, the summary of biology courses taught by time of day and campus is:

CYP: courses are offered morning, afternoon and evening

EVC: courses are offered morning, afternoon and evening

NRG: courses are offered morning, afternoon and evening; 1 course offered Friday night

PIN: courses are offered morning, afternoon and evening

RGC: courses are offered morning, afternoon and evening

RVS: courses are offered morning, afternoon and evening

FBG: courses are offered only in the evenings

HHS: courses are offered only in the daytime to HHS students

The biology program offers a variety of courses college-wide. The majority of courses are offered at RVS and RGC. The number of biology sections offered at CYP, EVC, RVS, RGC, EVC, and PIN has increased since Fall 2000 to meet student needs. The numbers of sections at RGC and NRG have remained fairly constant, due to the lack of available lab and lecture space.

## NUMBER OF SECTIONS TAUGHT BY TIME OF DAY

The biology program offers many courses at different times throughout the day to meet the needs of a diverse student population (see the following table). The majority of classes are offered in the morning. Weekend courses have not been particularly successful, partly due to the lecture/lab format of most biology courses. Since data cannot be presented in a table, only a comparison of Fall 2001 and Fall 2004 is listed below.

Morning: 45 sections taught in Fall 2001 compared to 55 sections taught in Fall 2004, an increase of 22%

Afternoon: 39 sections taught in Fall 2001 compared to 54 sections taught in Fall 2004, an increase of 38%

Evenings: 31 sections taught in Fall 2001 compared to 43 sections taught in Fall 2004, an increase of 39%

List the number of sections taught (by location).

Due to the appalling lack of flexibility of this form, a data table showing the number of sections taught at all campuses by semester could not be entered into this summary. For that reason, we have only included comparison information for two semesters: Fall 2001 and Fall 2005.

Comparison of Sections Offered at CYP in Fall 2001 compared to Fall 2004: 13 versus 22, an increase of 69%.

Comparison of Sections Offered at EVC in Fall 2001 compared to Fall 2004: 3 versus 5, an increase of 67%.

Comparison of Sections Offered at NRG in Fall 2001 compared to Fall 2004: 13 versus 13, an increase of 0%.

Comparison of Sections Offered at PIN in Fall 2001 compared to Fall 2004: 8 versus 11, an increase of 38%.

Comparison of Sections Offered at RGC in Fall 2001 compared to Fall 2004: 23 versus 37, an increase of 61%.

Comparison of Sections Offered at RVS in Fall 2001 compared to Fall 2004: 36 versus 37, an increase of 3%.

Comparison of Sections Offered at OPC in Fall 2001 compared to Fall 2004: 14 versus 17, an increase of 21%.

List the number of sections closed or canceled per course.

In Fall 2001, 14 biology sections were closed. In Fall 2004, 24 biology sections were closed. This is an increase of 71%.

In Fall 2001, 9 biology sections were cancelled. In Fall 2004, 27 biology sections were cancelled. This is an increase of 300%. The extremely high number of canceled Human Anatomy/Human Physiology sections reported in Fall 2004 was due to changes in the course number and name, as well as the implementation of prerequisite assessment exams that students must pass to enroll in these courses. Students were blocked from registering for the course until they passed the exam. The biology department provided this information in the print and online schedules, on the biology department home page, and disseminated information to Allied Health departments, as well as to Counseling and Advising departments on all campuses. Flyers were also posted in strategic places on all campuses. Unfortunately, many students were unprepared and could not register for courses, so many sections were cancelled.

How does each of the five-year demographic trends (gender, ethnicity, age group) for this program compare to the overall college trend? (List the source of your information.)

Biology students are essentially the same as all ACC students in terms of ethnicity, and age. Significantly more females (and fewer males) take biology courses than the college average, which is due to the high number of biology students pursuing Allied Health Programs.

The following is based on Fall 2004 data (our best estimate) provided by the Office of Institutional Effectiveness:

Gender of Biology Students: 72.7% female, 27.3% male  
Gender of all ACC students: 56.3% female, 43.7% male

Ethnicity of Biology Students: 62.9% white, 6.7% Black (non-Hispanic), 20.0% Hispanic, 5.5% Asian/Pacific Islander, 0.6% American Indian/Alaskan Native, 2.6% International, 1.6% Other/Unknown

Ethnicity of all ACC Students: 60.5% white, 7.1% Black (non-Hispanic), 22.5% Hispanic, 5.1% Asian/Pacific Islander, 0.8% American Indian/Alaskan Native, 2.4% International, 1.7% Other/Unknown

Average Age of Biology Students: 26.4 years  
Average Estimated Age of all ACC Students: 25.9 years

Identify any unnecessary barriers to students, especially those who are educationally disadvantaged and not well served by other colleges.

None

**[d] Student outcomes including participation and successful-completion rates**

How do course completion rates (A-B-C-D rates) for courses within this program compare to College norms?

Based on Fall 2004 data, the course completion rates for biology courses are comparable to the college norms.

Grades earned in Biology Courses: 27% A, 24% B, 15% C, 3% D, with 6% F

Grades earned in all ACC Courses: 28% A, 22% B, 16% C, 3% D, with 8% F

What are the program completion or graduation rates (compared to intent as well as overall) for this program?

The following number of students have graduated from ACC with an associate of science degree in Biology or an associate of science degree in Pre-Dental/Pre-Medical/Pre-Pharmacy/Pre-Veterinarian:

2000-2001 8 students

2001-2002 3 students

2002-2003 5 students

2003-2004 4 students

The vast majority of students enrolled in biology courses either transfer without an associate of science degree to other institutions to complete a four-year degree or enter an Allied Health Program at ACC or other institutions.

How do withdrawal rates for courses compare to College norms?

Based on Fall 2004 data, the withdrawal rates for biology courses are slightly higher than the college norms.

Withdrawals in Biology Courses: 24% W

Withdrawals in all ACC Courses: 21% W

List the expected learning outcomes for the program.

The overall objectives for our program are:

1. To prepare biology students with fundamental biological skills and knowledge needed to transfer to another institution.
2. To provide general education that prepares students to think critically and apply their knowledge of biological sciences to problems and concerns facing our society.
3. To prepare students with fundamental biological skills and knowledge needed to enter and succeed in a workforce program/certificate.

The department has also identified specific common course objectives for each course taught in the biology department. Common course objectives can be found at: [www.austincc.edu/biology](http://www.austincc.edu/biology) and identify specific learning objectives for both lecture and lab by course.

What do the results of the program's student learning outcomes assessments (departmental final exams, exit tests, standardized tests, etc.) indicate about the program?

The biology department does not have departmental final exams, exit tests or standardized tests.

### **[e] Measures of program quality and educational value added**

- **Academic Standards**

What are the processes and procedures that the department uses to maintain academic standards and achieve consistency within the department?

The Biology Department has developed common course objectives for all courses, common to all campuses. Full-time and part-time faculty who teach specific courses formed subcommittees and agreed upon specific learning objectives for both lecture and labs. The common course objectives have been provided to all instructors teaching biology courses. All instructors have agreed to use the common course objectives to teach the "core course content". These objectives are periodically reviewed to meet the changing needs of the discipline, students and community. All courses have up-to-date syllabi on file. At each campus, syllabi for all biology classes are kept in the office of the Math/Science administrative assistant. Syllabi are updated each semester. The department has developed a common master format for all course syllabuses that is available to all faculty. Course Syllabi, tests, quizzes, final exams and other student assessment tools for all courses taught by each instructor are part of the regular faculty evaluations to help ensure academic standards and consistency within the department.

- **Curriculum**

What procedures are used to assure that the curriculum is current and adequately meets the needs of students?

The Biology Department reviews the biology curriculum regularly in order to assure that it complies with requirements of the Texas Coordinating Board for Higher Education (the Coordinating Board) and the Texas Common Course Numbering System. In addition, individual courses are reviewed as needed in order to assure that the content of transfer courses meets the requirements of the senior level institutions to which ACC students most frequently transfer. Course textbooks are current and kept up to date. As new textbooks that might be suitable for the biology courses become available or as editions change, members of the Biology Department form subcommittees to review textbooks.

Are learning outcomes defined for courses and the program?  Yes  No

Are course texts up-to-date?.  Yes  No

Are course and program listings in the ACC Catalog up-to-date?  Yes  No

Do all courses have up-to-date syllabi on file?  Yes  No

Evaluate the use of instructional resources (including those in the library).

Since the last self study, library resources at all of the campuses have improved, especially at EVC and CYP. In the last self study, specific areas of weaknesses were identified, specifically microbiology, botany and cell/molecular biology. The library staff have purchased subscriptions and publications to expand the biology collection college-wide.

Most biology instructors and students today rely heavily on web access. The LRS should focus less on encyclopedic resources and more on resources that are not readily available online, such as regional information, local identification guides and breaking news in science and technology. For example, a standardized collection of guides for Texas flora and fauna should be available on all campuses that offer relevant biology courses. Biology students would benefit if all libraries carried dissection guides for anatomy & physiology courses and organismal based courses. There are also some excellent software programs that include virtual dissections, experiments and other animations that would be useful tools for faculty and students.

The LRS could also play a role in improved access to archived ACC data, reports and records. Currently, finding information for internal reports is difficult and time-consuming. The process could be made simpler if all such information were archived in a single location.

We also recommend that the LRS increase its subscriptions to periodicals and primary journals as a way to encourage professional development activities for science faculty.

Further, we recommend that ACC improve its Interlibrary Loan Services to be on par with other regional colleges and universities. Currently, ACC cooperates with UT Austin in providing access to their primary periodical resources. However, as ACC faculty, we are not permitted to access UT's excellent ILL system. This makes it difficult for ACC faculty to find and use these resources for research or sabbatical activities. We recommend that ACC develop some kind of cooperative agreement with UT to allow use of their ILL system or support the development of a comparable resource within our own institution.

Evaluate the extent to which technology impacts the mode of instruction, including the number of courses and sections taught via distance learning.

Almost all of the biology courses incorporate web-based activities as part of the standard curriculum. This includes case studies, exposing students to current research, using web-based animations to supplement lecture instruction, homework assignments and other outside activities. Five of our biology courses (BIOL 1406, 1407, 1409, 2102 and 2421) have incorporated moderate to significant use of technology in the laboratories. In

particular, BIOL 2102 uses computers in lab to capture data on physiological experiments, which the students subsequently analyze. BIOL 2421 requires online case studies and online research about diseases as the last unit of instruction for the course.

The biology department has made a serious commitment to incorporating distance learning as a part of our program. In 2004-2005, 48% of our courses offered at least one online section (12 courses out of 25 courses). Online sections accounted for almost 13% of the total number of biology sections taught (49 sections out of 384). The biology department regularly attempts to find solutions to the problems of offering online courses that have a required laboratory component. We are limited in expanding the number of online courses by lack of staff and lack of available laboratory space.

Evaluate the extent to which instruction is focused on problem solving, active learning, and work-based elements.

The biology department incorporates problem solving and critical thinking skills in every course that is offered. An examination of the common course objectives for each biology course will reveal that significant emphasis is placed on this aspect of learning. Our laboratory activities are designed to both teach specific skills and to require students to solve problems related to the lab activities. Many instructors also incorporate problem solving and critical thinking activities as homework assignments or in-class activities. Many biology instructors, especially in anatomy, physiology and microbiology, include extensive use of case studies which links problem-solving skills with real-life experiences. Since many of our students are interested in health-related careers, the use of case studies helps to provide them with the problem-solving skills they will need to succeed in their chosen programs.

List below the current discipline-specific courses within the program and the date of the latest review.

	Date of Last Review
<u>BIOL 1309</u> Life on Earth	April 2002
<u>BIOL 2306</u> The Living Planet	
<u>BIOL 1322</u> Contemporary Issues in Nutrition	
<u>BIOL 1323</u> Human Nutrition	
<u>BIOL 1406</u> Cellular and Molecular Biology	
<u>BIOL 1407</u> Structure and Function of Organisms	
<u>BIOL 1408</u> Introductory Biology -- Unity of Life	
<u>BIOL 1409</u> Introductory Biology -- Diversity of Life	
<u>BIOL 1413</u> General Zoology	
<u>BIOL 1413</u> General Zoology	
<u>BIOL 1424</u> Native Plants	
<u>BIO 1614</u> Field Biology	
<u>BIOL 2206</u> Environmental Biology Lecture	
<u>BIOL 2304</u> Human Anatomy Lecture	
<u>BIOL 2305</u> Human Physiology Lecture	

BIOL 2316 Genetics  
BIOL 2404 Introduction to Anatomy & Physiology  
BIOL 2406 Ecology and Evolutionary Biology  
BIOL 2420 Introduction to Microbiology  
BIOL 2421 Microbiology  
BIOL 2321 Survey of Infectious Diseases

- **Faculty**

Do all faculty teaching in the program meet SACS requirements?

Yes  No (if no, please explain)

Follow the directions below to complete the SACS *Roster of Instructional Staff*.

Column One: Provide the name of the faculty member and indicate full or part time status.

Column Two: List, from the *ACC Catalog*, the course prefix, course number, and course title of all credit courses taught. If appropriate for establishing the relationship between the course and the faculty member's qualifications, provide the course description as well. Indicate whether the courses are Transfer (T) or Non-Transfer (N).

Column Three: List each academic degree earned by the faculty member, and indicate the discipline (concentration or major) of each degree; the institution which awarded the degree; and the total number of graduate semester hours earned in each discipline in which courses have been (or will be) taught.

Column Four: Specify qualifications such as diplomas or certificates earned (with field indicated), related work experiences in the field, professional licensure and certifications, honors and awards, continuous documented excellence in teaching, and other demonstrated competencies and achievements (such as publications or papers presented) that contribute to effective teaching and student learning outcomes. Make clear the relationship between these qualifications and the content of the courses assigned to the faculty member.

1) Name	2) Courses Taught	3) Academic Degrees Earned	4) Other Qualifications
Albin, Leslie O, FT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2305/2102- Human Physiology Lecture and Lab(T); BIOL 2420-Intro to Microbiology (T); BIOL 2421- Microbiology (T)	M.S. Biology North Texas State University	Continued teaching excellence
Allen-Mierl, D'Maris A, FT	BIOL 2420-Intro to Microbiology(T);BIOL 2421-Microbiology	Ph. D. Science Education University of	Continued teaching excellence

	(T); BIOL 1309-Life on Earth (T)BIOL 2321-Survey of Infectious Diseases (T);	Texas at Austin. 19 hours Biology	
Bostic, Stephen R, FT	BIOL 1406-Cellular and Molecular Biology (T); BIOL 1407-Structure and Function of Organism (T); BIOL 1411-Botony (T);BIOL 1408-Intorductory Biology: Unity of Life (T); BIOL 1411-Botony (T)	Ph. D. Botany University of Texas at Austin	Continued teaching excellence
Estes, Yvonne, FT	BIOL 2306-Living Planet (T);BIOL 1309-Life on Earth (T); BIO 1614-Field Biology (T)	Ph. D. Science Education University of Texas at Austin. 121 hours Biology	Continued teaching excellence
Fletcher, Linnea A, FT	BIOL 2421-Microbiology (T); BIOL 2316-Genetics (T)	Ph. D. Microbiology University of Texas at Austin	Continued teaching excellence, Presenter at several annual conferences, Bio-link Annual Conference, Bio & biotechnology Institute 2003-2005, Awarded Bio TechEd ATE project, Co-taughtNSF-funded Chautauqua short course in Bioinformatics, June2003, 2004, 2005
Fofi, Richard, FT	BIOL 1406-Cellular and Molecular Biology (T); BIOL 2404- Intro to A&P (T) BIOL 2304/2101-Human Anatomy Lecture and Lab (T) BIOL 2305/2102-	M.S. Biology Angelo State University	Continued teaching excellence

	Human Physiology Lecture and Lab (T)		
Froehlich, David J, FT	BIOL 1408- Intorductory Biology: Unity of Life (T) BIOL 1409- Introductory Biology: Diversity of Life (T);BIOL 1406- Cellular and Molecular Biology (T) BIOL 1407-Structure and Function of Organisms (T)	Ph.D. Geological Sciences University of Texas at Austin . 19 hours in Biology	Continued teaching excellence
Jarzem, Jacquelyn	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T)	Ph.D. Zoology University of Texas at Austin	Continued teaching excellence
Juarez de Ku, Laura, FT	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T)	Ph. D. Biological Sciences Bowling Green State University	Continued teaching excellence
Keddy-Hector, Anne C, FT	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T);BIOL 2406- Ecology and Evolutionary Biology (T); BIOL 2106- Environmental Biology Lab (T); BIOL 2206- Environmental	Ph. D. Biology University of California-Los Angeles	Continued teaching excellence

	Biology Lecture (T)		
Mackey, Audrey L, FT	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T)	Ph. D. Science Education University of Texas at Austin and M.S. Biology Texas State Univesity	Continued teaching excellence
Mathis, Suzette D, FT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T) BIOL 2404- Intro to A&P (T);BIOL 2420- Intro to Microbiology (T)	M.S. Biology Texas State University	Continued teaching excellence
Maxim, Elizabeth J, FT	BIOL 1407-Structure and Function of Organisms (T) BIOL 1408- Intorductory Biology: Unity of Life (T) BIOL 1409- Introductory Biology: Diversity of Life (T); BIOL 1309-Life on Earth (T); BIOL 2306-Living Planet (T)	M.S. Biological Sciences-Zoology University of Texas at Austin	Continued teaching excellence
Meyertholen, Edward P, FT	BIOL 1406-Cellular and Molecular Biology (T); BIOL 2305/2102- Human Physiology Lecture and Lab (T)	Ph.D Biological Sciences Purdue University	Continued teaching excellence, sabattical leave, Thomas Jefferson U. Studying Site Specific Mutagenesis, creating trangenic mice and transfecting eukaryotic cell lines
Muzos, Steven J, FT	BIOL 1408- Intorductory Biology:	Ph.D Science Education	Continued teaching excellence

	Unity of Life (T);BIOL 1309-Life on Earth (T); BIOL 2306-Living Planet (T)	University of Texas at Austin and 19 hours in Biology	
Phelps, Patricia A, FT	BIOL 1406-Cellular and Molecular Biology (T);BIOL 1408-Intorductory Biology: Unity of Life (T);BIOL 2316-Genetics (T)	Ph.D. Chemistry; 30 hours in Biochemistry	Continued teaching excellence
Sessions, Alice J, FT	BIOL 1406-Cellular and Molecular Biology (T);BIOL 1408-Intorductory Biology: Unity of Life (T);BIOL 2316-Genetics (T)	Ph. D. Biology Johns Hopkins University	Continued teaching excellence
Shaw, Terry, FT	BIOL 1322-Contemporary Issues in Nutrition (T); BIOL 1323-Human Nutrition (T)	M.S. Nutrition University of Texas at Austin	Continued teaching excellence
Speer, Bernice , FT	BIOL 1407-Structure and Function of Organisms (T);BIOL 1409-Introductory Biology: Diversity of Life (T);BIOL 1309-Life on Earth (T); BIOL 2306-Living Planet (T);BIO 1614-Field Biology	M.S. Zoology Brigham Young University	Continued teaching excellence
Strong, Sarah L, FT	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T)	M.S. Physiology Penn State University	Continued teaching excellence
Tavormina, Salvatore J, FT	BIOL 1406-Cellular and Molecular Biology (T); BIOL 1408-Intorductory Biology:	M.S and Ph.D. Biology University of Wisconsin	Continued teaching excellence

	Unity of Life (T);		
Wayne, Charles R, FT	BIOL 2404- Intro to A&P (T) BIOL 2304/2101- Human Anatomy Lecture and Lab (T) BIOL 2305/2102- Human Physiology Lecture and Lab (T)	M.S. Physiology Rutgers University	
Ziser, Steven W, FT	BIOL 2404- Intro to A&P (T); BIOL 2304/2101- Human Anatomy Lecture and Lab (T);	M.S. Louisiana State University and A&M Biology and Ph.D. Biology University of New Mexico	Continued teaching excellence
Acosta, Shelley, PT	BIOL 1406-Cellular and Molecular Biology (T);BIOL 1408- Intorductory Biology: Unity of Life (T)	M.S. Biochemistry Texas A&M. 19 hours Biology	Continued teaching excellence
Alsup, Harold W, PT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2404- Intro to A&P (T)	M.S. Biology East Texas Stae University	Continued teaching excellence
Beaman, Charles L, PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 2420-Intro to Microbiology (T)	M.S. Biology Texas State University	Continued teaching excellence
Britton, Larry N, PT	BIOL 2421- Microbiology (T)	M.S. Microbiology Louisiana State University and Ph.D Microbiology University of Iowa	Continued teaching excellence
Caskey, Nourah, PT	BIOL 1408- Intorductory Biology: Unity of Life (T);	M.S. Biology Texas State University	Continued teaching excellence
Christensen, Carl W, PT	BIOL 2404- Intro to A&P (T); BIOL 2304/2101- Human Anatomy Lecture and Lab	Ph.D. Biology Tulane University	Continued teaching excellence

	(T)		
Davis, Kenneth J, PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 1409- Introductory Biology: Diversity of Life (T);BIOL 2420-Intro to Microbiology (T)	M.S. Biology University of Texas Health Science Center	Continued teaching excellence
Dunn, Charles D., PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 1309-Life on Earth (T)	M.S. Botany University of Texas at Austin	Continued teaching excellence
Ewing, Evelyn PT	BIOL 1408- Intorductory Biology: Unity of Life (T)	Ph. D Biology University of Kansas at Lawrence	Continued teaching excellence
Flemming, Margaret T, PT	BIOL 2404- Intro to A&P (T); BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2305/2102- Human Physiology Lecture and Lab (T)	M.S. Veteriary Physiology Texas A&M	Continued teaching excellence, nominated for Teacher of The Year
Greene, Stephen D, PT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T);BIOL 2404- Intro to A&P (T)	M.S. Biological Sciences Marshall University	Continued teaching excellence
Hawkins, Laura, PT	BIOL 1323-Human Nutrition (T)	M.S. Nutrition San Jose State University	Continued teaching excellence
Hazle, Nita J, PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 2306-Living Planet (T)	M.A. Zoology Universtity of Texas at Austin	Continued teaching excellence
Hollingsworth, Kristine, PT	BIOL 2420-Intro to Microbiology (T)	M.S. Microbiology Brigham Young University	Continued teaching excellence

Jorgenson, Ron, PT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2404- Intro to A&P (T)	Ph.D Biology Johns Hopkins University	Continued teaching excellence
Keelen, Jennifer	BIOL 1406-Cellular and Molecular Biology (T)	M.A Microbiology University of Texas at Austin	Continued teaching excellence
Keddy-Hector, Dean P.	BIO 1614-Field Biology (T); BIOL 2304/2101-Human Anatomy Lecture and Lab (T); BIOL 2305/2102- Human Physiology Lecture and Lab (T); BIOL 2404- Intro to A&P (T); BIOL 1413- General Zoology (T)BIOL 2206- Environmental Biology Lecture (T);	M.S. Wildlife Ecology Oklahoma State University and 49 hours Biology and related courses	Continued teaching excellence
Kirk, Dana D, PT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2404- Intro to A&P (T)	M.S. Biology West Texas A&M	Continued teaching excellence
Lane, Rhonda M, PT	BIOL 1323-Human Nutrition (T)	M.S. Nutrition Texas Women's University	Continued teaching excellence
Lewis, Robert C, PT	BIOL 2420-Intro to Microbiology (T)	M.S. Microbiology Texas A&m University	Continued teaching excellence
Koehler, Dayle J., PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 2420-Intro to Microbiology (T)	M.S. Biology Texas State University	Continued teaching excellence
Machart, Jan M, PT	BIOL 2305/2102- Human Physiology Lecture and Lab (T)	Ph. D. Biology University of	Continued teaching excellence
Marcyniuk, Patrick K, PT	BIOL 1408- Intorductory Biology:	M.S. Biology Lamar University	Continued teaching excellence

	Unity of Life (T);BIOL 1406-Cellular and Molecular Biology (T);		
Mayes, Bonny C, PT	BIOL 2304/2101-Human Anatomy Lecture and Lab (T);BIOL 1413-General Zoology (T) BIOL 2404- Intro to A&P (T)	M.S. Biology Texas State University	Continued teaching excellence
Mogull, Scott, PT	BIOL 1406-Cellular and Molecular Biology (T);BIOL 2420-Intro to Microbiology (T)	M.S. Microbiology University of Texas at Austin	Continued teaching excellence
Moreland, Amy, PT	BIOL 1309-Life on Earth (T); BIOL 1409-Introductory Biology: Diversity of Life (T)	M.S. Biology North Texas State University	Continued teaching excellence
Morin, Silke M, PT	BIOL 2305/2102-Human Physiology Lecture and Lab (T)	M.S. Neuroscience University of Texas at Austin	Continued teaching excellence
Norris, John	BIOL 1406-Cellular and Molecular Biology (T); BIOL 1424-Native Plants (T); BIOL 2404- Intro to A&P (T);BIOL 2420-Intro to Microbiology (T)	Ph.D. Botany University of Texas at Austin	Continued teaching excellence
Ramirez Garza, Elizabeth A, PT	BIOL 1406-Cellular and Molecular Biology (T);	M.S. Biology University of Texas at San Antonio	Continued teaching excellence
Rocha, Dennis D, PT	BIOL 1408-Intorductory Biology: Unity of Life (T)	M.S. Biology Texas A&M University	Continued teaching excellence
Rohde, Rodney E, PT	BIOL 2420-Intro to Microbiology (T)	M.S. Biology Texas State University	Continued teaching excellence
Sathasivan, Kanagasabapathi , PT	BIOL 1406-Cellular and Molecular Biology (T)	Ph. D. Plant Health and Biochemistry Louisiana State University	Continued teaching excellence
Senter, John N, PT	BIO 1614-Field Biology (T); BIOL 1408-Intorductory	M.S. Biology Texas State University	Continued teaching excellence

	Biology: Unity of Life (T);BIOL 2406- Ecology and Evolutionary Biology (T)		
Shippen, Judy, PT	BIOL 2304/2101- Human Anatomy Lecture and Lab (T); L 2404- Intro to A&P (T)	M.S. Biology Brigham Young University	Continued teaching excellence
Stephenson, Amanda	BIOL 1408- Intorductory Biology: Unity of Life (T);BIOL 2420-Intro to Microbiology (T)	M.S, Biology Texas State University	Continued teaching excellence
Szabo-Hill, Aniko	BIOL 2304/2101- Human Anatomy Lecture and Lab (T);BIOL 2404- Intro to A&P (T)	Ph. D. Neuroscience Cornell University	Continued teaching excellence
Vander Zee, Coe A, PT	BIOL 1408- Intorductory Biology: Unity of Life (T); BIOL 2420-Intro to Microbiology (T)	M.S. Molecular Biology University of Texas at Dallas	Continued teaching excellence, will complete teaching certificate in August 2006
VanGorkom,, Eric	BIOL 2404- Intro to A&P (T); BIOL 2304/2101- Human Anatomy Lecture and Lab (T); BIOL 2305/2102- Human Physiology Lecture and Lab (T)	M.S. Biology Stephen F. Austin State University	Continued teaching excellence
Villarreal, Felix S, PT	BIOL 2420-Intro to Microbiology (T)	M.S. Biology Texas State University	Continued teaching excellence,

What is the ethnic diversity of the faculty?

<b>Ethnicity</b>	<b>% Full-time Biology Faculty</b>	<b>% Adjunct Biology Faculty</b>
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White	92.0%	85%
Hispanic	4.0%	10.0%
Black	4.0%	0%
Asian/Pacific Islander	0.0%	5%
Other	0.0%	0%

What evidence is there that faculty are staying current in their respective disciplines and instructional methodologies?

Faculty participate in professional society memberships in their discipline and instructional areas, attend seminars and workshops in their fields, subscribe to and read current discipline-related journals and magazines, and perform professional development activities on a continual basis throughout the year.

What recognition has been given to faculty within the last year?

None.

Describe professional development activities in which program faculty participate. Faculty participate in a variety of externally-sponsored seminars, workshops and conferences to update their knowledge and exchange information and ideas related to their instructional discipline. Every faculty member is also required to participate in Departmental Safety, HazCom and Chemical Waste Management workshops. Faculty also participate in college-sponsored professional development activities.

What percent (and the total number) of faculty participate in formal professional development activities on a regular basis?

100%, 23 full and 39 part-time faculty

Describe the types of discipline-related professional development activities offered.

At least once a year, workshops are given in the department to teach full-time and adjunct faculty how to use laboratory equipment and how to incorporate new techniques into the labs. All faculty are trained yearly in laboratory health and safety standards. Faculty that work with blood and tissue labs are also given additional training in blood-borne pathogens. Faculty who take students into the field on field trips are given additional training with safe field trip practices. .

What percent of sections do full-time faculty teach?

In 2004-2005, full-time faculty taught 51.3% of all biology sections, with adjuncts teaching 48.7% of the biology sections.

What percent of contact hours do full-time faculty teach?

In 2004-2005, full-time faculty taught 47.3% of all biology contact hours, with adjuncts teaching 52.7% of all biology contact hours. This difference is due to two factors: (1)

the large number of highly qualified adjuncts who teach microbiology courses with laboratory components, and (2) almost all of the distance-learning courses are taught by full-time faculty.

Are student evaluations of instruction within acceptable range?  Yes  No

To what extent are alternative modes of instruction incorporated into classes? Several biology courses are offered through Distance Learning. In addition, most of the biology courses taught in the classroom setting also incorporate some elements of alternate modes of instruction, including the use of CD ROMs, internet, computerized lab equipment, videos and computer software.

- **Student Satisfaction**

Do student course evaluations demonstrate satisfaction with courses?

Yes  No

**[f] Adequacy of program resources and efficiency of resource use**

Describe the overall adequacy of resources (human, technological and capital, facilities, and fiscal) available to the program for providing effective program delivery and outcomes.

The biology department rates the overall adequacy of resources as adequate but there are serious areas of weakness. We consider the quality of the biology faculty to be one of our strongest points. Inadequate and obsolete lab equipment is one of our greatest areas of weakness. Funding for instructional supplies, new capital equipment and replacement of old equipment is insufficient. Our lab assistants are over-worked and we do not have enough positions in this area. Most of our biology labs lack computers for student use. Some of the labs do not have computers and internet access in the labs at all.

What is the ratio of full-time to adjunct faculty (by course and for the program overall)?

59% of the faculty of the Biology Department are full-time.

How up-to-date is the equipment used by the program? In the previous self study, the biology department identified 13 broad categories of equipment resource needs. Since then, 62% of those resource needs have been provided by the college. In particular, the need for new microscopes, computers, printers and other lab equipment have largely been met. The Technology Committee has been very generous in providing replacements for defunct equipment. However, most of the new equipment resources have replaced old equipment that was non-functional. The equipment used in the biology labs do not meet up-to-date standards in certain courses, especially BIOL 1406 Cellular & Molecular Biology or BIOL 2421 Microbiology (both courses for science and pre-professional majors). None of the labs for BIOL 1406 have the necessary equipment to teach DNA replication techniques. This is an appalling lack, since many high schools are better equipped in this area than we are. In addition, some campuses still do not have the same

level of equipment and capital resources that other campuses do. Also, while some biology labs have laptops, the vast majority of the biology labs still do not have access to laptops for student use. Some of our labs do not have computer access to the internet.

One area of concern for the biology department is the loss of equipment (either by theft from locked laboratories or by catastrophic water damage that is beyond our control) that is never replaced. The department is not reimbursed for these items and it sometimes takes several years before they are replaced. We recommend that the college create a special budget subcode collegewide to replace, in a timely manner, equipment that is damaged, lost or destroyed.

Identify possibilities for improving the efficiency of the program's use of resources.

The biology department has already implemented certain policies to monitor resource use. We regularly check to see that the different campuses have the same level of equipment in all of the biology labs. As equipment unexpectedly fails, we request replacement items from the Technology Committee.

One major problem is there is no regular replacement schedule for laboratory equipment, especially for microscopes, water baths, pH meters and other standard lab equipment. We estimate these items have a life cycle of between 5 and 10 years. Currently, there is not a budgeting system in on-going laboratory equipment replacement, although the college does have a system for replacing computers. A regular predictable replacement schedule would be much preferred to the sudden catastrophic emergency replacement expenses we currently incur. Sudden disasters impact the learning environment for our students, especially when equipment suddenly is not available for use in student labs..

### **[g] Comparison of program performance, price, and enrollment with that of alternate local suppliers**

How is the program competitive with similar programs offered by other institutions or schools in the service area in terms of performance, cost to students, and enrollments?

The data needed to compare performance and enrollments in the ACC biology program with other institutions in the service area was not available. The institutions that we contacted would not release this information to us. The only items we were able to compare were student cost and number of available courses.

The cost of taking a four-hour biology course at ACC are significantly lower than any of the other higher-education institutions in the service area. The cost for an in-district ACC student ranges from 3.9% to 17.5% of the cost at other local higher education institutions. The cost for an out-of-district ACC student ranges from 8.6% to 38.3% of the cost at other local higher education institutions.

Comparison of the biology course offerings at the freshman and sophomore level suggests that the ACC biology program is directly comparable to other local higher-

education institutions. While the University of Texas at Austin offers a greater diversity and number of biology courses at the freshman and sophomore level, this is largely due to the number of specialized courses that they offer that are not part of the Common Course Numbering System. The biology course offerings at ACC are virtually identical to those of Texas State University and St. Edwards University. The biology department at ACC offers more courses at the freshman and sophomore level than Concordia University, Huston-Tillotson University or Southwestern University.

**[h] Direct and indirect program-related revenues and costs to the College**  
Identify the major sources of revenue for the program, including grants, partnerships, etc.

For FY 2004, State Funding was \$2,190,112, Tuition Revenue was \$1,590,210 and Lab Fees were \$156,338 for total direct revenues of \$3,936,660..

**Compare program costs to those of other ACC programs.**

For FY 2004, the direct program costs for Biology were \$3,135,182. The funding exceeded the direct costs for the biology department by \$801,478. For each student enrolled in biology courses, revenues per student were \$448, direct costs per student were \$357, with a surplus per student of \$91. The costs of offering biology courses is considerable for the college but is less costly than other comparable science programs with laboratories..

**Compare the program's actual expenditures to the approved program budget for the previous two years.**

The biology department has spent slightly more money in the last two years than was budgeted. However, this is primarily due to adding new biology sections to the schedule to meet student demand without the college correspondingly increasing the amount of money allocated for consumable supplies used in instruction.

**TRANSFER or WORKFORCE AREA-SPECIFIC INFORMATION**

**Only Workforce Programs complete the items below.**  
Report/status from latest external accrediting agency visit

█

When was the most recent program revision?

█

Number of declared majors intending to complete a program who complete degree/certificate requirements within 6 years

█

Average number of semesters it takes for students to gain degree/credential.

Number of graduates within the last three years

Demographics of graduates

Percent of graduates who are employed within one year of graduation.

What evidence exists that program completers (or near completers) are successful on the job? What, if available, are their beginning salaries?

Percent of employers indicating satisfaction with graduates.

Discuss the most recent results of Focus Group or internal survey of employers.

Number of employers indicating need for more graduates

Provide evidence of SCANS competency integration into course syllabi and programs.

How often does the program's advisory committee meet to discuss curriculum issues?

When and where are advisory committee minutes maintained and posted?

Evidence of recent review of curriculum by external advisory committee.

Advisory committee validation of entry level skills

**Only Transfer Programs complete the items below.**

Number and percent of graduates who transfer within one year of graduation.

Not available

### Number of articulation agreements with universities and colleges

The college had 21 articulation agreements as of August 6, 2004.

### Number of courses that transfer

20 courses out of 21. The only exception, BIO 1614 Field Biology, was a required course for another ACC program and is no longer taught.

### Number of student complaints about problems with course transfer

In the past four years, the Department Chair has answered several student queries about courses. In all cases, the Department Chair provided the web address for the common course objectives for the biology courses. In all cases, the receiving institution accepted the biology courses after reviewing the common course objectives. The department did not keep an actual count of student inquiries but they are estimated as 20 queries in the past four years.

Discuss the results of the most recent Survey/focus group of transfer institutions.  
Not available.

### Discuss data from transfer institutions if available.

The most recently available statistics on student transfer are from the ACC Transfer Student Performance Report dated Spring 1999. According to this report, The University of Texas at Austin (UT) enrolls 63% of ACC's transfer students. In Fall 1996, Science students from ACC earned 2.02 average GPA (grade point average) compared to all transfers of a 2.12 average GPA. Since this data is nine years old, there is no hard data on how well ACC students have been succeeding after transfer to UT. Personal communication with UT faculty indicates that ACC biology transfer students succeed as well in the UT biology program as students who have been enrolled in UT from the beginning (2005).

Texas State University (TX State) enrolled about 20% of the transfer students at the time of the 1999 report. ACC transfer students outperformed other community college transfer students for all the years tracked, 1991 through 1997. For example in 1997, the average GPA for ACC transfer students to TX State was 2.50 while the average GPA for all community college transfer students was 2.45. This data is not divided by discipline so it is impossible to gauge how well ACC Biology students perform upon transfer. Furthermore, no inference may be made of success in the past five years since there are no recent statistics.

### Number of students transferring successfully.

The outcomes from student transfers from 2001 indicate that 52% of the declared biology majors transferred to another Texas higher-education institution (300 out of 578 students). There were 6 graduates in the biology program that year.

## CONCLUSIONS

Based on the information collected and analyzed during the program review process, what are the major conclusions of this review of the program? Summarize them here and complete the *Program Status* form.

The biology department is doing the best to prepare our students for their future careers and educational pursuits with the resources that are available to us. We are understaffed, particularly with regards to lab assistants. As more biology sections are added to the schedule without additional funding, the department is underfunded with regards to consumable supplies and equipment under \$500. Although we have been attempting to equalize resources at the different campuses for the past four years, we have been limited by inadequate funding. As a result, resources are not comparable at all campuses where biology labs are taught.

### PROGRAM VISION STATEMENT

State the program's vision or preferred future for the next five years. The vision statement should provide direction to the program as it makes improvements to enhance its effectiveness and efficiency.

Over the next five years, the biology department needs to focus on successfully managing the growth in the department as the college adds new campuses and new buildings. One area of potential concern is making sure that the facilities and equipment needed for lab classes are equivalent from campus to campus. We will also need additional faculty, both full-time and adjunct, to staff new sections. We will also need to hire additional lab assistants to ensure adequate preparation for lab courses.

A second area that needs improvement is assessment. We are going to propose to the department that we change assessment tools from standardized testing to another form of assessment. One possibility would be to link successful completion of a biology course prerequisite to another course or program. For example, student success in BIOL 2305/2102 Human Physiology could be linked to student success in the first semester of the ACC RN program. Another possibility would be to link student success in BIOL 2404 Introduction to A&P to another ACC health science program (LVN or Paramedic). A third possibility would be to link student success in BIOL 1406 Cellular & Molecular Biology to student success in BIOL 1407 and/or BIOL 2421, both of which require BIOL 1406 as a prerequisite.

Our third area would be to continue to advocate for new equipment funding, especially for the expensive capital equipment needed for high-tech BIOL 1406 labs that we are currently unable to offer. Another need is for laptop computers for student use in all biology labs.

Our last vision is to try to help the Fredericksburg campus meet the needs of their students, especially the ones who wish to use the ACC/Texas Tech partnership to get a bachelor's degree. In order to meet the core curriculum needs of non-science major students at FBG, we need to offer BIOL 1408 and BIOL 1409 at FBG. Our department

has been unable to do so for lack of equipment and supplies needed to teach these courses. In order to offer these courses at FBG, the college would have to provide funds of about \$200,000 to outfit these labs.

## RECOMMENDATIONS

What does the self-study team recommend for improving or maintaining the quality of the program? Summarize the recommendations here and complete the *Quality Improvement Plan* form.

Our most pressing need is for additional lab assistants for the department, especially as the college continues to add more campuses and science labs. As the biology department grows in size, more full-time faculty will also be needed.

We need additional money allocated to the department for consumable supplies and for equipment under \$500 as more biology sections are added to the schedule.

Safety in our biology laboratories must be given priority at a college-wide level. Most biology lab rooms are undersized and crowded with equipment and supplies. Most of the lab space is so cramped that there is insufficient room between student stations or around the periphery of the room. There is not one single biology lab with adequate room for lab assistants to prep for classes or for adequate storage. Most of the older biology labs are sadly lacking in basic safety needs. RGC biology labs, for example, have inadequate air flow, no way to vent the rooms during dissections, and lack safety showers and eye-wash stations.

Teaching laboratories, especially with the new guidelines for safety and the use of increased technology in laboratories, takes as much (if not more) time as preparing for lecture. The college allocates 75% of actual in-class time for laboratories for science faculty, a formula that was developed over 30 years ago. We strongly feel that the college should reexamine this and give at least equivalent compensation for lecture and laboratory workloads.

We need to substantially upgrade the laboratories for BIOL 1406 and make them comparable to other higher-education institutions. This will require additional equipment that will enable us to teach DNA labs and other high-tech techniques in cellular and molecular biology.

We need to continue to ensure that resources are equivalent in all biology labs that are teaching the same course, regardless of the campus location. This will require additional funds from the college.

Biology students need a chance to study lab materials outside of the regularly scheduled lab periods. Only one campus has a dedicated study lab for science students. The other campuses have extremely limited hours for open lab time for student study. On most

campuses, these additional hours are only available to students enrolled in anatomy & physiology courses. Currently, most campuses only offer study hours on Friday. As more distance learning courses are added to the schedule, these labs are being scheduled during the only available times on Friday, which eliminates the ability to offer open labs at most campuses.

## **ADDITIONAL COMMENTS**

### **APPENDIX**

List all documents that you used in your report:

Documents provided by the Office of Institutional Effectiveness

Summary of Biology SWOT

Biology Self Study: Resources

Biology Self Study: Program Effectiveness

Biology Self Study: Responsiveness

Biology Self Study: Access

Biology Self Study: Comparison

Biology Student Characteristics by Age, Ethnicity and Gender

Comparison of Grades Earned by Biology Students and All ACC Students

When you have completed this report, send it via e-mail to the Manager of Quality Initiatives ([njokovic@austincc.edu](mailto:njokovic@austincc.edu)) as an attachment.

## Quality Improvement Plan for Biology Program

**Date Completed:** 11/11/2006

Please complete a table for each of the self-study team's recommendations for improving or maintaining the quality of the program. The first table provides information to assist you in determining what to put in each "cell." If you need more tables, please use the copy/paste function in word.

<b>Recommendation #</b>	1
<b>Recommendation:</b>	Review the BIOL 2304/2101 and BIOL 2305/2102 assessment tests and make revisions as needed
<b>Planned Implementation date:</b>	9/1/2006
<b>Estimated Completion date:</b>	Initial phase completion 1/16/2007. Review and revision ongoing.
<b>Action/Task</b>	Review objectives and exam questions. Revise both as needed. Review relationship of exams to completion rates in BIOL 2304/2101 and 2305/2102.
<b>Measure of Success/ Desired Outcome</b>	Measure correlation of exam grades to course grades.
<b>Estimated Cost(s)</b>	Accomplish by departmental personnel.
<b>Consequence if not funded</b>	none
<b>Who is responsible?</b>	Biology faculty.

<b>Recommendation #</b>	2
<b>Recommendation:</b>	Try to find a way to implement online testing for the assessment tests with rapid feedback to students
<b>Planned Implementation date:</b>	3/1/2006
<b>Estimated Completion date:</b>	11/15/2006
<b>Action/Task</b>	Work with Instructional Technology and testing center personnel to develop and online testing process for the assesment tests.
<b>Measure of Success/ Desired Outcome</b>	Accomplish online testing for assessment exams.
<b>Estimated Cost(s)</b>	None. This will be a pilot program for fuurther uses of online testing by the coll.ege
<b>Consequence if not funded</b>	None. Will be a pilot program.
<b>Who is responsible?</b>	Biology faculty, Instructional Technology, and testing center personnel.

<b>Recommendation #</b>	3
<b>Recommendation:</b>	Explore new ways to prepare students for the assessment tests
<b>Planned Implementation date:</b>	1/18/2006
<b>Estimated Completion date:</b>	ongoing
<b>Action/Task</b>	Prepare online instruction, conduct classroom instruction, and compile lists of references and resources for students to use to review for

	assessment exams.
<b>Measure of Success/ Desired Outcome</b>	Providing ample opportunities for student preparation, resulting in increased success on exams and increased completion rates and success in BIOL 2304/2101 and BIOL 2305/2102.
<b>Estimated Cost(s)</b>	\$30,000 for teachers to conduct continuing education classes.
<b>Consequence if not funded</b>	No continuing education class would be available and all instruction would be online or self-taught.
<b>Who is responsible?</b>	Biology faculty, Dean of Math and Sciences, VP for Academic Transfer and General Development

<b>Recommendation #</b>	4
<b>Recommendation:</b>	Hire more full-time faculty to teach high-demand biology classes
<b>Planned Implementation date:</b>	1/18/2006
<b>Estimated Completion date:</b>	6/30/2006
<b>Action/Task</b>	Write job descriptions, advertise positions, screen applications, interview candidates, check references, hire faculty.
<b>Measure of Success/ Desired Outcome</b>	Successful hiring of new faculty to teach high-demand biology classes.
<b>Estimated Cost(s)</b>	\$250,000 for salaries, benefits, office space and furniture, computers, and supplies.
<b>Consequence if not funded</b>	Reliance on adjunct faculty to teach high-demand classes has resulted in many high-demand classes not being added, or canceled, for lack of Qualified faculty to teach them. Instructors are overloaded.
<b>Who is responsible?</b>	Biology faculty, Dean of Math and Science, Vice President for Academic Transfer and General Development, President of the College, Board of Trustees, and Human Resources.

<b>Recommendation #</b>	5
<b>Recommendation:</b>	Review equipment in all biology labs and continue to work toward having comparable lab facilities at all campuses
<b>Planned Implementation date:</b>	1/18/2006
<b>Estimated Completion date:</b>	ongoing
<b>Action/Task</b>	Review equipment needs for all biology labs at all campuses and sites where ACC biology classes are taught. Prepare budget requests for equipment where deficiencies are identified.
<b>Measure of Success/ Desired Outcome</b>	Ample up-to-date and state-of-the-art equipment for all biology labs college-wide.
<b>Estimated Cost(s)</b>	\$100,000
<b>Consequence if not funded</b>	All biology labs will continue to struggle to have adequate equipment, some of which will be out-of-date and/or worn out. Some biology labs will continue to have insufficient equipment and some

	out-of-date and/or worn out equipment.
<b>Who is responsible?</b>	Biology faculty, Dean of Math and Science, VP for Academic Transfer and General Development, President of the College, Board of Trustees, Purchasing.

<b>Recommendation #</b>	6
<b>Recommendation:</b>	Review common course objectives periodically
<b>Planned Implementation date:</b>	1/18/2006
<b>Estimated Completion date:</b>	ongoing
<b>Action/Task</b>	Review and revise, if necessary, the course objectives of all courses offered by the ACC Biology Department.
<b>Measure of Success/ Desired Outcome</b>	Maintaining and publishing on the Biology web site, an up-to-date list of course objectives for every biology course.
<b>Estimated Cost(s)</b>	none
<b>Consequence if not funded</b>	none
<b>Who is responsible?</b>	Biology faculty

<b>Recommendation #</b>	7
<b>Recommendation:</b>	Compare our biology course content to other institutions and revise as necessary
<b>Planned Implementation date:</b>	1/18/2006
<b>Estimated Completion date:</b>	ongoing
<b>Action/Task</b>	Research catalog descriptions, course syllabi, and course objectives for courses taught by the ACC Biology Department and by other colleges. Compare the quality of the courses, agree where deficiencies occur in ACC courses, if any, and if there are deficiencies, plan to correct those deficiencies.
<b>Measure of Success/ Desired Outcome</b>	State-of-the-art course offerings provided by the ACC Biology Department.
<b>Estimated Cost(s)</b>	\$150,000 for state-of-the-art equipment for BIOL 1406 and BIOL 2102 labs.
<b>Consequence if not funded</b>	Out-of-date lab instruction and technology in BIOL 1406 and 2102.
<b>Who is responsible?</b>	Biology faculty, Dean of Math and Science, VP for Academic Transfer and General Development, President of the College, Board of Trustees, Purchasing.