

Biology Department Assessment Plan AY '04

Part I – Assessment Summary AY '04

A. Biology department Mission Statement:

The mission of the biology department is to provide quality education to the students we serve as well as furthering the overall mission of the college.

The purpose of the Biology Department is to provide educational services in the areas of biology for the residents of Arapahoe and Douglas Counties and surrounding areas. The department takes a learner-centered approach and offers courses for both full and part-time students with a focus on improving student learning. The courses support vocational programs as well as transfer requirements for science and non-science students. Community interest courses and developmental and tutorial courses are also offered. The department is committed to quality education in the areas of biological science, incorporating application of the most current theory, biology-oriented technology, and educational methods.

B. Intended Learning Outcomes (competencies)

After taking any biology course at ACC, the student will:

1. Students will demonstrate mastery of specific course competencies for Human Anatomy & Physiology (Bio 201 and 202) as listed in ACC's anatomy and physiology supplement, *The Human Organism: Function & Form*, at a level equal to or greater than the exam average recorded on the national exam administered on a national level by the Human Anatomy And Physiology Society.
2. Students will be able to analyze data and suggest answers or solutions to problems.
3. Biology students will be able to demonstrate the appropriate use of technology and laboratory equipment.
4. Students will demonstrate the approach, logic and application of the scientific method and be able to apply these principles to real-life problems.
5. Students will exhibit the ability to read and write about science-related materials.

C. Benchmarks

1. Overall average on the assessment exam will exceed the national average (unavailable) and improve from AY '03 (unavailable).
2. Students' ability to analyze data will be assessed.

D. Assessment Results

Outcomes to be assessed during AY'04

We choose BIO 202, all sections, and will assess outcomes #1 and #2. This is a continuation of the previous year's departmental assessment. This year's assessment includes numbers 3, 4 and 5 and will consist of compiling data from Bio 201 and 202 laboratory practicals. In addition, assigned case studies will be analyzed for learning outcomes 4 and 5.

Assessment method:

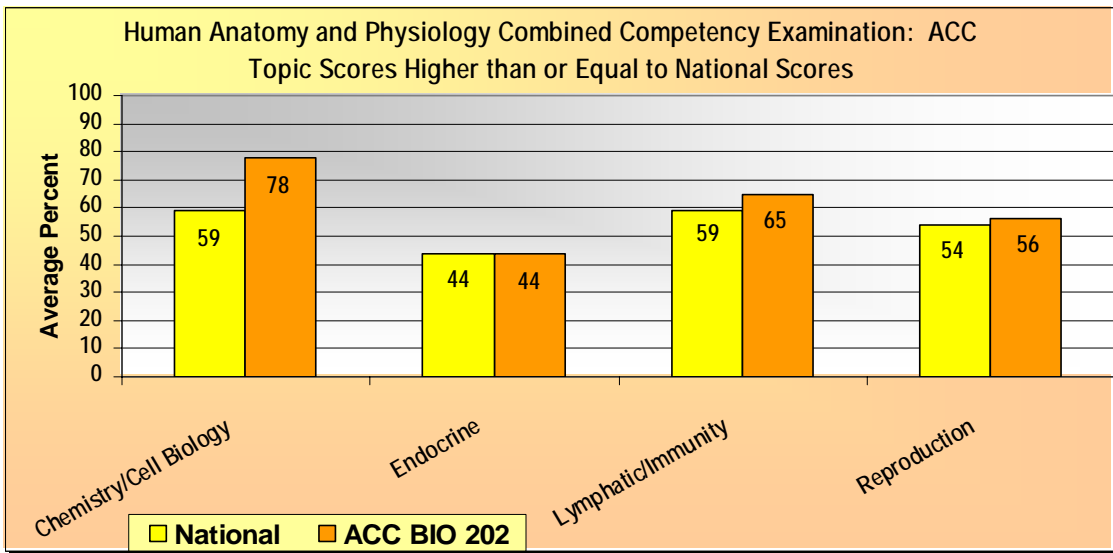
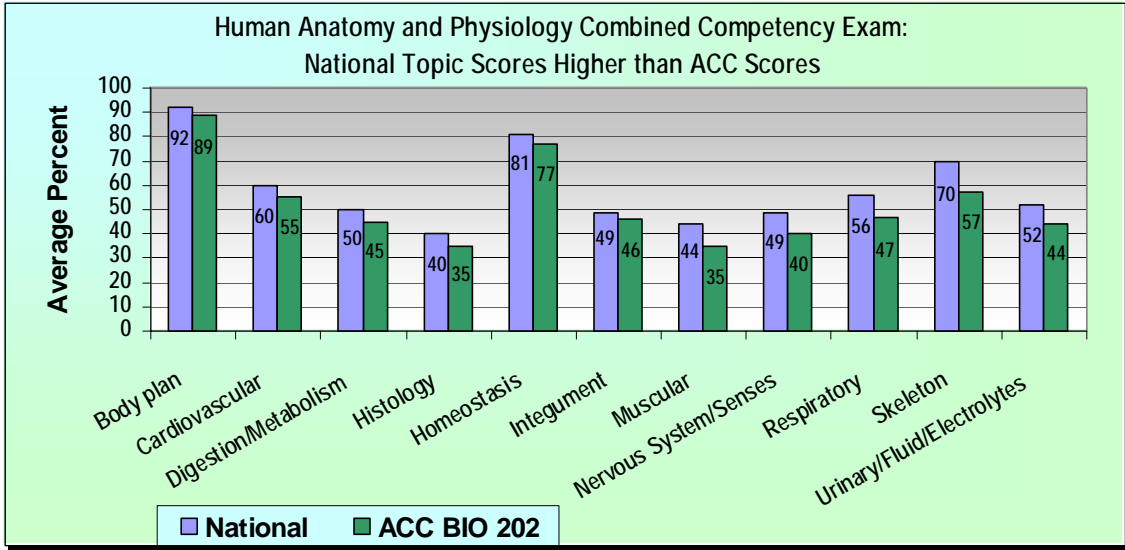
Each BIO 202 student will take an assessment final examination. The test consists of 100 multiple-choice questions that are derived from the first and second semester anatomy and physiology courses. The test is a copy of the 2001 Version of the Human Anatomy & Physiology Society (HAPS) exam. The Human Anatomy and Physiology Society (HAPS) was founded to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences (local, regional, and national) where members can obtain information about the latest developments in the health and science fields; and to encourage educational research and publication by HAPS members. The Biology Department Chair, Terry Harrison, will coordinate the assessment. A study guide will be given to all students. The test will be given during the student's lab time during the last week of the semester. Each student will have 1 hour to take the test. The students are provided with a common scantron answer sheet. The grade obtained on the assessment exam counts in their final course grade. This exam specifically addresses learning outcomes 1 and 2. There are some questions that could be considered satisfactory for learning outcome number 4 as well.

In addition to the Bio 202 assessment exam, data will be collected from a Bio 201 assessment exam as well.

With this test we hope to learn the following:

1. Did the students develop an understanding of the anatomy and physiology of each system?
2. Did students retain information from the first semester?
3. Were there systems that we needed to work harder on?
4. How did the Internet students (hybrid and dihybrid) compare with the traditional-delivery students?
5. How did the different lecture sections compare?

Results: FY03



Descriptive Statistics for HAPS Exam – Fall 2003 (AY '04)

Mean	51.61818182
Mode	32.72727273
Standard Deviation	27.15173037
Minimum	5.454545455
Maximum	100
Count	100

Descriptive Statistics for Bio 201 Assessment Exam – Fall 2003

Mean	35.02564103
Mode	34
Standard Deviation	7.702208081
Minimum	5
Maximum	67
Count	78

Bio 202 Assessment Exam – Spring 04

Mean	52.77777778
Mode	50
Standard Deviation	24.92662883
Sample Variance	621.336825
Minimum	5.555555556
Maximum	100
Count	100

E. Discussion

The following suggestions for future assessment efforts were developed from the Department of Institutional Research after reviewing the outcomes for the Biology Program, and the 2003-2004 data. Also included are interpretations of some of the results:

1. The two tables shown in the Results document shows the score comparisons between the national “ten institutions” and the ACC average scores for each content area in the Human Anatomy and Physiology Competency Examination. The Arapahoe students scored the same or better than students from other schools on four content areas, but less well on eleven others. This information was used in the department to make instructors aware of these deficiencies and to encourage greater attention to these subjects.
2. The distribution of ACC overall exam results could be compared with the distribution of overall national results if the ACC and national data were made available. Consider obtaining this information for future program assessment analyses.
2. The mean assessment grade from Fall 2003 to Spring 2004 increased from 51.6 to 52.8 indicating a steady improvement from semester to semester and from previous assessment report.
3. The descriptive statistics for the Bio 201 assessment exam indicate a 70% passing rate (exam was worth 50 points). This exam contained a written component which addressed learning outcome 5.

Part II – Assessment PLAN AY'05

A. Intended Learning Outcomes (competencies)

After taking any biology course at ACC, the student will:

1. Students will demonstrate mastery of specific course content by taking a departmental assessment. .
2. Students will be able to analyze data and suggest answers or solutions to problems through laboratory practical exams and quizzes..
3. Biology students will be able to demonstrate the appropriate use of technology and laboratory equipment (microscopes, blood pressure cuffs, ECG, centrifuge, etc.) through laboratory practical exams and quizzes.
4. Students will demonstrate the approach, logic and application of the scientific method and be able to apply these principles to real-life problems.
5. Students will exhibit the ability to read and write about science-related materials.

B. Assessment Procedures/Methods

Administer a standardized, discipline-based exam to all students completing the first and second semesters of Anatomy & Physiology. The exams assess student knowledge and skills in 15 areas (body plan, cardiovascular, digestion/metabolism, histology, homeostasis, integument, muscular, nervous system/senses, respiratory skeletal, urinary/fluid electrolyte balance, chemistry, cell biology, endocrine, lymphatic/immunity and reproduction). These assessment indicators map to the core content areas and the scientific skills in the desired outcomes (1, 2 and 4).

Administered standardized discipline-based laboratory exams created by the department to all students that attend an anatomy & physiology course at ACC. Similar exams in other content areas (microbiology, general biology which cover the following knowledge and skills (not inclusive): biochemistry & cell energetics; cellular structure/organization/function; molecular biology/molecular genetics; diversity of organisms; animal structure & function; plant structure & function; population genetics & evolution; ecology; and analytical skills) will be reviewed for inclusion by fall 05. These assessment indicators map to the core content areas and the scientific skills in the desired outcomes (1, 2, 3, 4 and 5) and provide a second method to determine accuracy of measurement.

Course evaluations completed each semester and peer review of teaching effectiveness to identify specific content areas the instructor can address to help their students demonstrate a mastery of specific competencies listed in the *Harrison and Johnson A&P* supplement.

Open discussion between biology department and biology undergraduates with a specifically designed exit questionnaire.

Performance in classes where scientific skills are emphasized.

C. Benchmarks

- ❑ All students that take anatomy & physiology will take the assessment exam.
- ❑ Students must perform at or above the national average on the standardized exam as compared to the Human Anatomy & Physiology Society data.
- ❑ Discipline specific areas that are specifically identified will be evaluated based on a simple rubric, which will be used as an initial standard for future comparison.