

# 2005 Program Review for the Life Science Discipline

## Topic I. Where Are We Now?

### A. Purpose and Goals

Relationship of Discipline Activities to the Mission, Vision and Strategic Goals of the College

*The District provides transfer programs paralleling the first two years of University offerings:*

The discipline offers a wide selection of UC, CSU transferable courses for majors including:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 11	Introduction to Molecular and Cellular Biology	5
BIO 12	Introduction to Organismal and Population Biology	5

The following courses are transferable courses offered for non-majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 1	General Biology	4
BIO 2	General Zoology	5
BIO 3	Field Botany	4
BIO 5	General Botany	4
BIO 7	Marine Biology	4
BIO 8	Ecology (with lab)	4
BIO 10	Principles of Life Science	3
BIO 30	Human Reproduction and Sexual Behavior	3
BIO 34	Human Genetics	3
BIO 36	Man and the Environment	3
AMY 2A	Anatomy and Physiology I	4
AMY 2B	Anatomy and Physiology II	4
AMY 10	Survey of Human Anatomy and Physiology	3
MIC 1	Microbiology	4
HES 1	Health Science	3

Biology 1 meets the general education requirement for transfer students as well as fulfilling the requirement for graduation from high school. It fulfills the laboratory science requirements for transfer of non-science majors.

Health Science (HES 1) not only fulfills a general education requirement but is also required for students obtaining a California teaching credential.

*The District provides pre-professional, career preparation, and occupational and technical programs:*

Many courses are consistently offered to provide the prerequisite requirements for allied health programs such as LVN, RN, dental hygiene, physical therapy,

physician assistant, radiation technician, E.M.T., respiratory therapy and other related biomedical programs:

<u>Number</u>	<u>Name</u>	<u>Units</u>
AMY 2A	Anatomy and Physiology I	4
AMY 2B	Anatomy and Physiology II	4
AMY 10	Survey of Human Anatomy and Physiology	3
MIC 1	Microbiology	4

In addition, course offerings are provided for students entering preveterinarian, premedical, pre dental, prepharmacy, physical therapy, dental hygienist, and naturalist programs:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 2	General Zoology	5

Several of the discipline courses provide the foundations needed for biological sciences, forestry, agriculture, environmental science, landscape design, horticulture, and general nature studies:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 5	General Botany	4
BIO 7	Marine Biology	4
BIO 8	Ecology (with lab)	4
BIO 9	Introduction to the Natural History of Southern California	3

***The District provides pre-college, tutorial, and supplemental instruction for under-prepared students:***

The discipline has created two new courses, Biology 96 and 97, which are open labs available to any student enrolled in a biological science lab course. They are designed to provide an environment for extra laboratory studies, group work, and computer or peer tutorials.

Other courses offered by the discipline that provide a biological framework for non-majors are Biology 1 (General Biology), Biology 3 (Field Botany), Biology 5 (General Botany), Biology 10 (Principles of Life Science), Biology 34 (Human Genetics), Anatomy 10 (Survey of Human Anatomy and Physiology) and Biotechnology 1.

Biology 1 provides a strong introductory biological science background for students in all academic arenas and helps to ensure student retention in majors courses and success in certificate/licensure programs.

All life science faculty maintain office hours and encourage students to contact

them outside of class hours whenever necessary for additional support and guidance. Many instructors also use computer enhanced technologies such as PowerPoint to increase the breadth and visual scope of lecture and lab material and to provide varied learning modalities for the diverse learning styles of students.

When available, College Tutorial Services provide student tutors in the areas of biology, microbiology, and anatomy/physiology.

Library and lab access to CD-ROM technology/tutorials is also available for students in the discipline.

***In the tradition of general education, the liberal arts and sciences and the occupational and technical programs and courses prepare students for intellectual and cultural awareness, critical and independent thought, and self-reliance:***

The content of RCC life science courses require students to assimilate and master abstract concepts and theories. Many courses offered in the life sciences focus on students learning the scientific method and to apply the scientific method to solve problems, analyze data, to develop critical thinking skills, form logical conclusions, and recognize the limitations of science. These courses give students background information, requiring them to apply their knowledge to solve problems in the classroom or to come up with answers to questions. By learning to think critically, students can apply the relevance of biological principles to their daily lives, to make informed decisions regarding personal choices, government issues, environmental issues and toward their own health.

Several courses offered by the life science discipline facilitate the development of cultural and social awareness, critical and independent thought, and self-reliance. These courses include Biology 9 (Introduction to the Natural History of California), Biology 30 (Human Reproduction and Sexual Behavior), Biology 34 (Human Genetics), and Biology 36 (Man and the Environment).

***RCC Goals 1995-2005: To tailor programs and services to meet the needs of the students and communities served by the three-campus (college) District. Improvement of student retention and success by strengthening certificate, degree, and transfer programs and by establishing new programs and course sequences that lead students to opportunities for transfer education and career preparation:***

The life science discipline works closely with the nursing department at RCC to ensure that the necessary courses and curriculum are offered to meet the needs of all nursing students. This includes working with nursing faculty when establishing or changing prerequisites or altering the sequence of courses offered.

Each campus has developed its own emphasis which has influenced decisions for courses/programs offered in the life sciences:

### Moreno Valley

The Moreno Valley campus has created several new programs for health care careers. These include the physician assistant, dental hygiene, and dental technology programs. Several of these programs require life science courses as a prerequisite. Although the discipline has added several sections of the required courses, there are still large numbers of students who are not able to obtain the required courses to complete their prerequisites. This is largely due to lack of facilities and full-time faculty. The discipline faculty continue to lobby for more full-time faculty while working towards meeting the needs of these students.

### Norco

The emphasis of the Norco campus is engineering and manufacturing (applied technology). With this emphasis in mind, the science faculty of the Norco campus is exploring the development of an Applied Environmental Technology program. The discipline at this campus has also focused on providing courses that meet the needs of students entering allied health programs such as nursing. Offerings are limited due to lack of facilities and full-time faculty.

### Riverside

The life sciences on this campus continue to maintain close ties with the nursing program which is also housed on the Riverside campus. New faculty have been added to allow new, much needed sections of anatomy and microbiology in an attempt to accommodate the large number of allied health students needing the courses. The Riverside campus has also become the location that attracts students who are majoring in biology as the other two campuses do not yet offer courses for majors on a regular basis. Until new facilities are completed and additional technical support is provided, the Riverside campus is unable to add more sections which would accommodate biological science majors.

## **B. History**

### **1. Major Developments, Activities, Changes or Projects in the Discipline Over the Past Five Years**

#### **The Discipline:**

With the increase in the general student population at RCC has come a subsequent increase in students needing life science courses. In addition, the growth of the Nursing program and the addition of Physician Assistant and Dental Hygiene programs has impacted the discipline with larger numbers of allied health students needing to fulfill life science prerequisites.

All three campuses have responded to this growth by striving to increase sections of those courses most in demand. However, growth of the discipline at each campus has largely been dependant upon the number of

full-time faculty or laboratory classrooms available to the discipline on that campus.

Several new courses were added by the discipline in the last five years. They include:

Introduction to the Natural History of Southern California (BIO 9),  
and Practicum in Life Science (BIO 96 and 97).

The discipline is in the process of creating a plan for assessment of life science courses. It is the goal of the life sciences to have an assessment process established and to pilot an assessment in the Biology 1 classes on all three campuses in the fall of 2005.

New Anatomy lab manuals were developed for Anatomy 2A and 2B by discipline faculty. The new labs are easily revised and updated each year to correspond with the anatomy curriculum at RCC.

Biology faculty at all three campuses are working towards coordinating both lecture and lab curriculum to ensure the implementation of a district-wide biology curriculum.

**Riverside:**

Several improvements have been made in the past few years to improve the physical/technical environment in the life science laboratories at the Riverside campus:

1. LCD projectors were installed in most of the biology laboratories to aid in lecture/lab presentations and demonstrations. Two lab classrooms are still in need of this technology.
2. Two small offices were constructed to accommodate growing faculty numbers in the department.
3. In an attempt to address safety and ventilation issues, an autoclave/prep room was constructed and the autoclave was relocated from the microbiology room to the new prep room.
4. A printer/fax room was added to the department.
5. An incubator was purchased for use in microbiology labs.
6. The life science, chemistry, physics and nursing departments are currently collaborating on a proposal for a new building to house these programs on the Riverside campus.

The Riverside campus continues to focus on providing courses and curriculum for biology majors as well as meeting the needs of students whose focus is health care.

In response to the growth of the college and the nursing department, two new faculty were hired by the department and the number of anatomy/physiology sections were subsequently increased.

Two additional faculty will be added to the department beginning in the fall of 2005. This will allow for further addition of life science sections.

An additional part-time laboratory technician was recently hired to help with the increased lab preparation load.

The discipline at Riverside has committed to service more biology majors by making the following changes in the past few years:

1. Addition of a second BIO 11 laboratory
2. Restructuring of existing BIO 11 laboratories
3. Procurement of laboratory equipment for new BIO 11 labs
4. Addition of new faculty for future BIO 11 sections

Marine Biology (BIO 7) and Ecology (BIO 8) are now being offered on a regular basis. Ecology (BIO 8) was restructured to include a laboratory/field component.

Biology faculty developed a new lab manual which updates the current lab exercises. This includes new activities with cell division, taxonomy, biological models, DNA extraction, and natural selection. In addition, existing exercises were modified to be more quantitative.

New laboratory manuals for both Anatomy 2A and 2B were developed and fully implemented by spring 2003.

**Norco:**

With initially only two full-time faculty members in the Life Science program, the Norco campus originally focused on offerings in biology, anatomy/physiology and health science. This focus was based on general student need and lack of an adequate number of full-time faculty to offer additional courses. As the campus grew, classes were developed and added in General Botany (BIO 5) and General Ecology (BIO 8). Beginning in 2000, with the addition of a full-time faculty member, the Norco campus began offering microbiology on a consistent basis.

New equipment has been added to the science laboratories to enhance instruction and support the addition of new course offerings. These include the following:

1. Seventeen computers were installed permanently in the science laboratories.
2. Computers and projectors were added in both science laboratories to aid with presentations/demonstrations.
3. Microscopic slides and new laboratory equipment were purchased to support the new Botany and Ecology classes

**Moreno Valley:**

In the last 5 years we have instituted some new laboratory techniques and equipment.

In Microbiology new experiments and instrumentation include:

1. Introduction of enzyme-linked immunosorbent assay (ELISA) to update immunological techniques performed in the laboratory. Kirby Bauer Susceptibility testing was introduced and a new hand washing experiment was also introduced. Results for the latter experiment have been compromised due to lack of hot water in the Moreno Valley Microbiology Lab\*.
2. A fluorescent (ultraviolet) light microscope was purchased along with an adaptor to project microscopic images onto a television screen to facilitate student understanding of various bacteriological stains and microscopic structure.
3. A new incubator was purchased to accommodate additional laboratory sections, but there is no space for the incubator in the laboratory. Remodeling requests for additional counter space (including the addition of two sinks with hot water) has still not been done and the incubator has been in storage since 2002\*\*. We have also purchased adjustable micropipettors and a water bath for use in the laboratory.

\*Please note this item was finally rectified in the fall semester of 2005.

\*\*This item was finally rectified in the fall of 2005.

Biology 11 (Introduction to Molecular and Cellular Biology) was first introduced at the Moreno Valley campus and offered in 2001 and 2002. Unfortunately, this course was discontinued with the retirement of the only full-time biologist on the campus. The hiring of two new full time faculty for the Biology department at the Moreno Valley campus and additional laboratory support should enable the Moreno Valley campus to continue to offer Bio 11 and the sequel, Bio 12.

Laboratory instrumentation for performing ELISA testing (including spectrophotometer and plate washer) was purchased for the Biotechnology program, Electrophoresis apparatus, adjustable pipettes and other equipment purchased for the Biotechnology program are being used in Microbiology and Biology 11 courses when offered.

In Anatomy and Physiology computer tutorials were developed to enhance student learning during labs. New laboratory manuals for both Anatomy 2A and 2B were developed and fully implemented by spring 2003. The new manuals include up-dated terms and activities including several exercises that require analysis and diagnosis using signs and symptoms in a simulated clinical setting.

Bio 96 – a practicum in life sciences, was introduced as a supplemental course to provide faculty-directed instruction, additional time for lab exercises, and possible tutorial services within a laboratory environment. It has been offered on the Moreno Valley campus since the fall of 2003 and has been received enthusiastically by Anatomy 2A and 2B students.

## C. Programs and Curriculum

### 1. Programs/Course Sequences

#### UC, CSU transferable courses offered:

##### Riverside campus:

The following courses are transferable courses offered for biology majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 11	Introduction to Molecular and Cellular Biology	5
BIO 12	Introduction to Organismal and Population Biology	5

The following courses are transferable courses offered for non-majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 1	General Biology	4
BIO 2	General Zoology	5
BIO 3	Field Botany	4
BIO 5	General Botany	4
BIO 7	Marine Biology	4
BIO 8	Ecology (with lab)	4
BIO 10	Principles of Life Science	3
BIO 30	Human Reproduction and Sexual Behavior	3
BIO 34	Human Genetics	3
BIO 36	Man and the Environment	3
AMY 2A	Anatomy and Physiology I	4

AMY 2B	Anatomy and Physiology II	4
AMY 10	Survey of Human Anatomy and Physiology	3
MIC 1	Microbiology	4
HES 1	Health Science	3

**Moreno Valley:**

The following courses are transferable courses offered for biology majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 11	Introduction to Molecular and Cellular Biology	5

The following courses are transferable courses offered for non-majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 1	General Biology	4
BIO 8	Ecology (with lab)	4
BIO 10	Principles of Life Science	3
BIO 30	Human Reproduction and Sexual Behavior	3
BIO 36	Man and the Environment	3
AMY 2A	Anatomy and Physiology I	4
AMY 2B	Anatomy and Physiology II	4
AMY 10	Survey of Human Anatomy and Physiology	3
MIC 1	Microbiology	4
HES 1	Health Science	3
BIT 1	Introduction to Biotechnology	1

At this time, due to a lack of full-time faculty, the Moreno Valley campus has had to remove or limit courses/programs for biology majors. Courses such as Introduction to Molecular and Cellular Biology, Ecology, Biotechnology 1, and man and the environment were removed from the schedule and will resume only in the event that the number of courses being taught by adjunct faculty is reduced drastically.

**Norco:**

The following courses are transferable courses offered for non-majors:

<u>Number</u>	<u>Name</u>	<u>Units</u>
BIO 1	General Biology	4
BIO 8	Ecology (with lab)	4
BIO 30	Human Reproduction and Sexual Behavior	3
AMY 2A	Anatomy and Physiology I	4
AMY 2B	Anatomy and Physiology II	4
AMY 10	Survey of Human Anatomy and Physiology	3
MIC 1	Microbiology	4
HES 1	Health Science	3
BIO 5	General Botany	4
BIO 34	Human Genetics	3

Courses at the Norco campus have also been limited by lack of full-time faculty. In addition to lack of faculty, Norco courses are also limited by inadequate laboratory facilities. The Norco campus has only two laboratory classrooms to utilize for all life science lab courses.

Information regarding how transferable courses are kept up to date is included in the section on 'Collaboration With Other Units' on page 20 of this document.

**Courses Required as Prerequisites for Certificate Programs:**

**Riverside, Norco and Moreno Valley:**

Anatomy 2A and 2B, Anatomy 10, Microbiology, and Biotechnology 1.

**Additional Courses Offered for General Education Requirements or Supplemental/Elective Work:**

**Without a Lab Component-**

**Riverside, Norco and Moreno Valley:**

Principles of Life Science, Practicum in Life Sciences, Survey of Human Anatomy and Physiology, Human Reproduction and Sexual Behavior, and Health Science.

**Riverside and Norco only:**

Genetics.

**With a Lab Component:**

**Riverside, Norco and Moreno Valley:**

General Biology, Human Anatomy and Physiology, and Microbiology, General Ecology.

**Riverside and Norco only:**

General Botany

**Riverside only:**

Natural History of Southern California, Field Botany.

**Courses Offered Specifically for Biology Majors:**

**Riverside only:**

Introduction to Molecular and Cellular Biology, Introduction to Organismal and Population Biology.

**Programs Involving/Impacting Life Science Courses:**

The nursing program, housed on the Riverside campus, requires several life science courses as prerequisites. The recent growth of the nursing program has caused an increased demand for these prerequisite courses at all three campuses.

The Moreno Valley campus has created several certificate healthcare programs that are exclusive to the campus. These programs, such as the physician assistant, dental technology, and dental hygiene programs have also impacted the life science courses on the campus since several are required as prerequisites for the programs.

## **2. Development of Curriculum**

### **Addition/Deletion of Courses:**

Several new courses have been added to the discipline in the past five years. They include:

Biology 96 and 97 (Practicum in Life Science) were added as supplementary course available to students enrolled in any life science lab course. It is an open lab that has been utilized mainly by anatomy students and has provided additional dissection/study time in the lab.

Biology 9 (Introduction to the Natural History of Southern California) was recently added to the life science course offerings. This course provides an avenue for field activities/excursions which are an integral component of biological and ecological studies.

The discipline has agreed to remove two courses from the curriculum offerings. Due to lack of need and/or obsolescence, both Biology 4 (Gardening) and Biology 40 (Interactive Video Biology). HES 4 (nutrition) is no longer offered through the life sciences since it has not been taught through the discipline for decades.

Discussion continues within the discipline regarding the discontinuation of Biology 10 (Principles of Life Science) due to lack of student need.

### **Adequacy of Course Offerings:**

Although all three campuses strive to offer adequate selection and number of courses to meet student needs, some areas continue to fall short.

Specifically, courses such as Anatomy 2A, 2B and Microbiology are continually in demand and as such can never be offered enough to accommodate all students needing the courses. Despite recent addition of sections on all campuses, some students continue to wait for up to two years to get into an anatomy or microbiology class. Often, there are more than 100 students trying to add on the first day of class (at several campuses).

Offerings of these courses are limited by space at the Riverside campus. Laboratory classrooms are not available for additional anatomy and microbiology classes.

Norco and Moreno Valley are limited by the number of full-time faculty and by available laboratory classrooms. Both campuses rely heavily on adjunct instructors as the number of full-time faculty is limited. This lack of faculty has made it impossible to continue increasing the number of sections offered. On the Norco campus, there are only two equipped labs on the campus for use with all life science courses.

Courses offered for biology majors are currently only offered at the Riverside campus.

### **3. Enrollment Trends**

The number of students and number of life science sections offered has been steadily increasing (approximately 40% growth) at both the Moreno Valley and Norco campuses since 2000, while both factors have decreased at the Riverside campus. This phenomenon largely reflects the response of the department at each campus to the student demand for specific courses (such as anatomy 2A, 2B and microbiology). Growth at the Riverside campus was limited by laboratory facilities, lack of instructors and a conscious effort to facilitate growth at the Moreno Valley and Norco campuses.

In the past five years, the growth in course offerings has been more of a reaction to an increased demand for specific courses than a predetermined growth plan. The discipline has been increasingly impacted with students needing the prerequisite courses for nursing, physician assistant etc. and has responded by adding sections of those courses.

Increased offerings of transfer or major courses has been limited or nonexistent at the MV and Norco campuses as most of the life science resources, (faculty, funding, facilities) are being utilized to meet the increased demand for anatomy and microbiology classes.

Sections of Biology 11 and 12 have increased substantially at the Riverside campus in an effort to enhance the transfer rates for biology majors.

Discussion has occurred within the discipline regarding the role of the college/discipline in supplying courses to transfer students and biology majors. The consensus of the discipline is to implement a core biology majors program at all three campuses allowing each campus to function as an independent college. Without the core biology courses required for

a biology major, the life science discipline serves only as a mere funnel to other programs. Until each campus has a fully functional biology majors program, they cannot become an accredited college. (citation from WASC)

Both the Moreno Valley and Norco campuses are in agreement that they lack courses specifically directed towards majors. Unfortunately this is due to lack of full-time faculty, facilities and budget at both campuses. It is the goal of the discipline to work towards addition of new faculty at both campuses and subsequent addition of classes for majors such as those currently being offered at the Riverside campus.

Further discussion regarding the addition of new courses for biology majors is ongoing and likely to result in development of curriculum specifically designed to meet the needs of these students.

#### **4.5.6. Relevant Trends in Knowledge Requirement, Skills/Competencies, and Instructional Methods.**

General discussion at discipline meetings indicates that students are lacking in basic reading and math skills. Many science students do not have the skills necessary to be successful in a typical science course.

The discipline intends to research the possibility of implementing a minimum score for English and math performance on the college assessment test as a prerequisite to any life science course.

General knowledge requirements for the life science courses have remained fairly stable over the last five-year period. These requirements are often defined by the course pre-requisite whenever specific knowledge is necessary for success in the course.

Instructional methods have changed over the last five-year period to incorporate advances in technology. Several faculty members now utilize computer technology into their lectures and labs. Internet sources are used for research by faculty and students and are frequently incorporated into the classroom. Computers are used in the laboratories for tutorial purposes and for laboratory exercises requiring computer interfaced devices. The biology discipline also has its own website.

#### **7. Prerequisites and Corequisites.**

Many courses have advisories that are not required. In the last two years we have changed these advisories to actual prerequisites for several courses.

The following courses currently require prerequisites to facilitate student success:

1. BIO 11 now has a chemistry 1A prerequisite.
2. The sequential prerequisite for BIO 12 is BIO 11.
3. Beginning in the fall of 2004, anatomy 2A became a sequential prerequisite for students entering anatomy 2B.
4. In the fall of 2005, new prerequisites will be implemented for enrollment into microbiology. New prerequisites will require successful completion of a college chemistry course (chem. 2A, 2B, 1A, 1B or chemistry 3), and a biological science course prior to registration for microbiology.

The chemistry discipline has provided a state approved exam that may be used to allow prospective microbiology students to take an alternative exam in place of the chemistry prerequisite requirement.

These prerequisites are consistent with courses that articulate with the CSU's and the UC's and are necessary to maintain these articulations. The prerequisites are periodically reviewed and validated during regular revisions in course outlines.

All other courses currently have no prerequisite.

**8. Are entry skills to courses, course sequences, and programs adequately defined and implemented? If not, what areas need to be addressed?**

Entry skills for those courses with prerequisites must be clearly defined and must correspond to the exit skills of the required prerequisite course. These entry skills are clearly defined during a content review process (prerequisite validation procedure) that must be completed before the establishment of prerequisites for any life science course.

**9. Expected Learning Outcomes of Programs/Course Sequences.**

The expected learning outcomes for each course are listed under the student learning outcomes on each course outline of record. The content area to be covered for each course is also given on each course outline. The learning objectives are reviewed periodically by the discipline through discussion at regular discipline meetings. For transfer courses, equivalent courses at the CSU's and UC's are reviewed and used as a comparison to retain transferability.

All course outlines for the life science discipline have been reviewed, updated and revised. Existing pre and corequisites were discussed and revised as

needed.

#### **D. Student Outcomes Assessment**

For the majority of our courses, the instructor is responsible for tracking student outcomes and success. For large courses, such as Biology 1, Health Science 1 with multiple instructors for lecture and/or lab sections, it is up to the individual instructors to follow the Course Outline of Record. Frequently, the group of instructors for one course collaborates to decide what required skills, knowledge, and assessment methods will be required of each student.

Some of the methods of assessment that are currently being utilized are listed below for particular subject areas:

##### **Anatomy courses**

Assessment methods currently include but are not limited to:

- Laboratory practicals requiring identification of anatomical structures, understanding of physiological principles, and demonstration of specific laboratory skills.
- Sectional and cumulative final lecture exams requiring in depth understanding of human anatomy and physiology and clinical correlations.
- Periodic quizzes to ensure daily understanding and proficiency in the required objectives as they are addressed.

##### **Biology courses**

Assessment methods currently include but are not limited to:

- Laboratory practicals requiring identification of living organisms, preserved specimens, organism life cycles, and interpretation of specific laboratory skills.
- Periodic laboratory quizzes to ensure daily understanding and proficiency in the required materials as they are presented.
- Sectional and cumulative lecture exams requiring in depth understanding of basic scientific principles, methods of inquiry, and the importance of biology and science in public life.
- Laboratory field trips to offer students “real life” experience, in applying biological principles and concepts to living systems.

##### **Health Science**

Assessment methods currently include but are not limited to:

- Exams and quizzes requiring application of knowledge indicating an understanding of what is required to maintain a healthy lifestyle.
- Written reports, assignments, and/or in-class presentations concerning topics discussed in class or extracurricular subjects related to the course as a whole.
- Evaluation of student self assessments utilizing logs of diet, exercise, stress and other areas significant to personal health.
- Evaluation of projects related to the student’s personal health.

##### **Microbiology**

Assessment methods currently include but are not limited to:

- Isolation and identification of unknown bacteria using scientific method accompanied by a written scientific paper on their findings.
- A written assignment is required for coliform analysis.
- Lab practicals test knowledge of basic microbiological techniques including differential staining, sterile technique, biochemical and serological tests.
- Periodic quizzes and sectional exams are given in both lecture and laboratory to test for proficiency and understanding of major microbiological concepts.

In addition to the methods currently being utilized for assessment, during the academic year 2004-2005, plans for developing additional assessment tools for the Biology 1 laboratory course were developed and a schedule of implementation was determined. The Biology 1 lab was selected for our first assessment because of the large volume of students participating in the course and because of the importance of critical thinking skills developed in this course. The assessment of Biology 1 labs will be used as a pilot and basis for development of assessment processes in other courses.

**Learning Outcome Assessment Schedule**  
Life Sciences Discipline

<b>Semester</b>	<b>Activity</b>
Spring 2005	Prepare Biology 1 Laboratory Rubric
Fall 2005	Collect data for Biology 1 Laboratory Skills
Spring 2006	Analysis of Assessment Process for Biology 1
Fall 2006	Repeat Cycle for Biology 1A Laboratory or begin assessment of Anatomy or Microbiology

Assessment will include:

1. Collection of data using the course assessment plan.
2. Discipline discussion of learning outcomes for the course and revisions to the course.
3. Analysis of data from Institutional Research for information on student success, gender, ethnicity, age, unit load, educational goals, and college preparation to better understand our student population.
4. Analysis of relevant data on student transfer and success.

***Biology 1 Laboratory Assessment Plan***

Each full-time biology instructor will submit the laboratory write-ups from one entire biology class for assessment by the discipline. The lab write-ups will be required for all students in the selected lab courses and are to be completed during the assigned laboratory exercise during week 6/7 of the semester. All student work submitted for assessment will be labeled by number rather than by name. The rubric, constructed by the discipline will be utilized to assess all collected lab write-ups during a grading session including the participation of all life science faculty. (See attached rubric).

Assessment design and rubric construction were based upon the desired student learning outcomes listed below.

### **Desired Student Learning Outcomes for Biology 1:**

Upon successful completion of the Biology 1 course, the student should be able to:

- 1. Relate biological concepts to multiple areas of their lives.**  
**Assessed by:** Exam questions selected by the biology discipline faculty teaching the course that semester.
- 2. Confidently apply the principles of the scientific method to experimental labs that will include quantitative data collection and analysis of the data.**  
**Assessed by:** Laboratory assignment from the Enzyme Lab to be assessed using the rubric agreed upon by the biology discipline faculty.
- 3. Analyze experimental results and relate them to the relevant concept.**  
**Assessed by:** Laboratory assignment from the Enzyme Lab to be assessed using the rubric agreed upon by the biology discipline faculty.

### **How Does Assessment of a Laboratory Exercise Test for These Student Learning Outcomes?**

Relationship of the assessment to each of the desired student outcomes being tested is stated in bold below.

Upon successful completion of the Biology 1 course, the student should be able to:

1. Relate biological concepts to multiple areas of their lives.  
**Laboratory demonstrates the activity and inhibition of a ubiquitous enzyme important in many plant and animal systems.**
2. Confidently apply the principles of the scientific method to experimental labs that will include quantitative data collection and analysis of the data.  
**Laboratory requires students to develop hypotheses, develop appropriate controls, and make quantitative and qualitative observations.**
3. Analyze experimental results and relate them to the relevant concept.  
Laboratory requires students to identify dependent and independent variables and state what the results indicate as appropriate to the question, hypothesis, and experimental design.

The discipline hopes to complete this first assessment by Spring of 2006. Modifications to the process will be made following completion of the first assessment. Once the process is perfected, other courses such as anatomy or microbiology will undergo a similar additional assessment process.

The outcome of this new assessment will be discussed at a discipline meeting. If needed,

changes in lecture/lab activities will be made to ensure that student learning outcomes are achieved.

**Sample Rubric**

**Assignment: Enzyme Activity Experimental Lab**

**Goal: To assess student's comprehension and application of the scientific method**

	Available Points				
	4	3	2	1	0
<b>Question and Hypothesis</b>	Students identify the observation, ask questions and present hypotheses that are appropriate to the lab activity, no flaws	Students identify questions and hypotheses that are appropriate to the lab activity, some flaws	Students have only one but not both the question (s) and hypothesis	Students write an observation only	Student does not make an observation, nor do they state the question and hypothesis
<b>Experimental Design</b>	Students have successfully identified the <u>dependent and independent variables</u> , the <u>control group(s)</u> , necessary <u>materials</u> , and clearly describes an experiment that will <u>accurately test</u> the hypothesis	Any four of the five components	Any three of the five components	Any two of the five components	No experimental design; or less than two of the five components
<b>Data Collection</b>	Students must present data appropriately using well labeled tables or graphs, data for all testable variables must be presented	All data is present, student is lacking one appropriate figure or minor flaws in data presentation	All data is present, student does not include any figures to present data	Student does not present all data or serious errors with data collection	No effort
<b>Data Analysis</b>	For each testable variable, students accurately state what the results indicate as appropriate to the question, hypothesis and the experimental design, no flaws	Analysis of all testable variables is not present; some incorrect interpretation	Students' work is lacking analysis of one variable, some some incorrect interpretation	Students' work is lacking analysis of more than one variable, more serious incorrect interpretations	Failure to include data analysis; students' understanding of data analysis or objective of the experiment is incorrect
<b>Conclusion</b>	Student <u>successfully relates the data analysis to the original question(s) and hypothesis</u> ; is able to make <u>conclusive statements</u> regarding the outcome of the experiment; <u>will include if the data supports or refutes the original hypothesis</u> ; conclusion will <u>include flaws in the experimental design, possible errors, or suggests improvements to the experiment during future labs</u>	Any three of the four components, minor flaws in students' conclusion	Any two of the four components, minor flaws in students' conclusion	Any two of the four components, more serious errors in the conclusion	Less than two of the four components and major errors in the students' conclusion; no conclusion presented

## **E. Collaborations with Other Units**

Dr. Lisa Thompson-Eagle has participated in statewide IMPAC (Intersegmental Major Preparation Articulated Curriculum) meetings to discuss biology majors core classes and articulation with representatives from other community colleges, the UC's, and the CSU's. These articulations have been essential to discipline decisions regarding course content, prerequisites, and other matters relevant to our courses for biology majors. We hope to continue participation in these meetings with a new discipline designee in the absence of Dr. Thompson-Eagle. In addition, several RCC science faculty are currently participating in the UCR Graduate School of Education's Copernicus Project.

The Life Science Discipline has collaborated with both the RCC Chemistry Discipline and the Department of Nursing. These meetings and efforts have resulted in joint decisions regarding prerequisite requirements for life science courses and in design of the new science building on the Riverside campus.

The Resource Conservation District is collaborating with the RCC life science discipline by providing internships for biology students who are interested in land restoration and environmental cleanup activities. Students will assist in cleanup of damaged sites and may have the possibility of obtaining employment with the conservation district.

The Discipline has also participated in meetings of organizations such as the American Association for Cancer Research (AACR). The AACR is the oldest and largest scientific organization in the world focused on every aspect of high-quality, innovative cancer research. It is comprised of more than 24,000 physicians and researchers. The annual meeting was held April 16-20, 2005 at the Anaheim Convention Center. AACR paid the registration and membership fees for one year for 28 of our students to attend the conference. We had the largest student group of any other college or university. They attended special student sessions and had access to all meetings of the organization.

## **F. Outreach**

Several RCC life science faculty attended meetings at UCR to become involved in the Copernicus Project. This project is a joint effort between UCR and several surrounding community colleges that is designed to attract more science majors to the field of teaching.

Life Science Discipline designees have also participated in annual meetings with teachers from neighboring high schools. The intent of these meetings is to review the required course content of Anatomy 10 so that high school instructors may offer the course and their students can receive college credit for the class (concurrent enrollment).

Several members of the Life Science Discipline (Dr. B.Vasquez, F. Galicia, Dr. M.Gutierrez) are mentors for the Puente programs on the various colleges.

The Puente program is dedicated to helping under served, under represented and first generation college students in making the transition from the 2 year community college to a 4 year university. The program provides assistance with guidance and basic skills, while introducing and traveling with the students to various 4 year universities in California.

Norco Faculty member (Dr. M. Gutierrez) is also the Science coordinator for the Upward Bound Program's Saturday Academy. The Upward Bound Program is dedicated to under served, under represented and first generation college bound high school students. Students attend academic programs on Saturdays for their entire high school education and offered guidance, transfer and financial aid information to keep them focused on their higher education goals. Students are introduced to various 4 year universities with annual visits to universities in California.

Norco Faculty member (Dr. B. Vasquez) is a member of the organization of AAUW (American Association of University Women) which promotes "education and equity for all women and girls".

## **G. Resources**

Resources are generally inadequate to meet the needs of students and faculty. Teaching science is an expensive undertaking. The Life Science discipline is often asked to offer classes (especially laboratory courses) without adequate resources to do the job appropriately.

Finding qualified and experienced faculty is difficult and in some subject areas nearly impossible. The department needs to develop a plan to ensure a continuing stream of qualified adjunct instructors. Such a plan would minimize the temptation of giving equivalencies to marginally qualified individuals for the sake of enrollment.

In the past, an RCC science internship program provided qualified and talented new instructors that the life sciences were able to utilize for adjunct and possible full-time positions. With the discontinuation of the program, it has become increasingly difficult to find competent instructors to staff the life science courses. Discipline members are in agreement that we would like the internship program re-established to aid in the mentoring and placement of life science instructors.

### **1. Staffing**

#### Moreno Valley

The life science discipline at the Moreno Valley campus has been operating with limited full-time faculty since the opening of the campus. In the fall of 2005, one additional full-time tenure track biologist was hired for the campus. Two one-year positions were also added. It is our hope to replace these two temporary positions with permanent faculty by the fall of 2006.

Even with the addition of the new faculty, the ratio of full-time to part-time faculty has not come near to reaching the 75: 25 ratio as outlined by AB1725.

In the fall of 2005, the assignments for faculty in the life sciences at the Moreno Valley campus are as follows:

<b>Subject Area</b>	<b>FT</b>	<b>OL</b>	<b>PT</b>	<b>% of courses taught by PT faculty or overloads</b>
Anatomy	2.4	.2	1.13	43%
Biology courses	1.2	.2	1.35	56%
Health Science	.4		1.6	80%
Microbiology*	1.0		.4	29%

\*Note that the percentages for microbiology are unusual--caused by low enrollment this semester due to implementation of new prerequisites. With normal enrollment (as will be expected in future semesters), 45% of the classes would be taught by overload or adjunct.

Throughout the history of the campus there has been a severe shortage of anatomy and microbiology courses available to students. The Moreno Valley campus has had to turn away 75 to 200 students each semester who have attempted to add these classes. Most anatomy and microbiology classes offered on the campus fill within hours of the onset of enrollment. This problem has been partially due to lack of full-time faculty and difficulty in obtaining adjunct instructors in these subject areas.

This year, fall of 2005, the problem continued even with the addition of a one year/temporary anatomy instructor. Despite the efforts of the department, campus and college to alleviate the problem, 80 to 100 students were unable to add an anatomy class on the Moreno Valley campus. The number of anatomy classes offered at the campus is now limited by lack of laboratory classrooms rather than by lack of faculty.

The two one-year positions need to be filled permanently and as the enrollment trend continues, an additional bio/anatomy/health instructor may need to be hired to accommodate growth in the next five to ten years.

#### Norco

##### **Present:**

1 FT Anatomy

1 FT Biology

1 FT Microbiology/Biology

1 FT Biology/Microbiology  
1 FT One-Year Temp. Anatomy  
7 PT Biology/Health Science/Anatomy  
2 FT Lab Technicians  
1 PT Lab Technician (75%)

Out of 26 sections (not including labs) offered at the Norco Campus, 10 (38%) are taught by FT faculty and 16 (62%) by PT. As in Moreno Valley, these percentages are also out of compliance with AB1725.

**Year 1 Planning:**

1 FT Anatomy → to replace the temporary position.

**Year 2-3 Planning:**

1 FT Biology (Molecular & Cell) → to establish major courses and new programs.

1 FT Biology (Organismal) → to establish major courses and new programs.

1 FT Lab Technician.

Norco Campus needs to address the establishment of Biology major courses for its growing population and to satisfy its mission as the Science and Technology site in the district. Advanced technology is only possible if the Math, Chemistry, Physical and Life Science programs are well developed. These three fields are committed to collaborate and thus provide opportunities for new certificates, and transfer opportunities.

**Year 5 Planning:**

1 FT Biology (Environmental/Ecology)

With the development of major courses completed, this new position will able the implementation of a new Applied Environmental Technology program to prepare students to function in an age of increasing technological needs.

Riverside

The Life Science department on the Riverside City campus has 10 full time instructors teaching classes for the 2005-06 school year. One full time faculty member is on a leave of absence. If the latter instructor returns for 2006-07, the department will have a full complement of full time instructors. If the instructor does not return we will need 1 more full time instructor.

The department currently has 1.5 funded classified positions. This is adequate for the short term, but consideration should be given to funding a full 2.0 positions.

During a typical semester the department has 8-12 adjunct professors. It is becoming increasingly difficult to find qualified instructors for certain courses, especially anatomy & physiology and microbiology.

## **2. Facilities**

### Moreno Valley

The present laboratory classrooms are well equipped and are being utilized to full extent. Maintenance of these rooms is minimal. Trash cans are usually emptied each night, however, very little cleaning is done. Lab sinks, counters and floors are not cleaned. Windows (with cobwebs) are also not being cleaned. By the end of the semester, the floors in the lab rooms are covered with dirt and mud.

Adding sections of Anatomy or Microbiology at Moreno Valley has become problematic for the following reasons:

1. With only one anatomy lab, instructors are already struggling to find time to prepare and administer lab exams. The lab classroom is being utilized continuously, with very little time allowed for instructors to set up the room for practicums. Although instructors have coordinated their efforts by coming in early or late to prepare exams in the prep room, the models, microscopes, slides and other equipment needed for lab exams is often in use by another class and cannot be removed for exam preparation. Another anatomy laboratory classroom needs to be constructed. There are no plans to build laboratory classrooms in the phase 3 building as such rooms will not be funded by the state.
2. Although the new pre-requisites have temporarily reduced the enrollment in microbiology classes this year, we expect to see the resumption of previous student numbers within the next year. With future growth in mind, a larger microbiology laboratory is needed to provide for more students. The current microbiology lab is too small to accommodate students safely. The lab is currently overcrowded. Refrigerators and incubators needed for the increase in sections have been added, however, there is no room for continued growth beyond what has already been done. The refrigeration and incubation capacity is at its maximum with 6 sections per semester.

A larger microbiology laboratory needs to be constructed that includes a larger prep and storage room. Once the new lab is constructed, the existing lab can be renovated and utilized as an additional lab for anatomy, biology or physics classes. The phase 3 construction does not include a micro lab.

3. The campus has limited rooms and time slots for the large lecture halls needed to conduct anatomy and microbiology lectures. Administration has worked willingly with discipline members to provide these lecture classrooms but growth of the campus and of the discipline has made availability of large lecture halls scarce. A new lecture hall will not be available until completion of the next phase (at least 5 years from now).

**Measure C monies should be utilized to provide additional laboratories on the Moreno Valley campus. Moreno Valley taxpayers agreed to pay additional taxes with the assumption that a fair portion of the money would be spent on their campus. Among the list of items that taxpayers agreed they would be most willing to fund, the addition of science labs was number one on the list.**

Norco

**Present:**

Norco Campus has only two (2) Science labs. One is dedicated to Anatomy and Ecology (7 sections: 13 labs), and the other accommodates Biology and Microbiology courses (6 sections: 3 labs, 5 Lecture/Lab).

Due to significant health and safety issues, a dedicated microbiology lab is essential to this campus.

**Year 1 Planning:**

Plans for redesigning the second floor of Humanities and Science and Technology buildings are already started in anticipation of a “secondary effect” implementation due to building of Phase III, and they include several complete science labs.

**Year 2-3 Planning:**

The development of major courses will add to the needs for additional lab space. At least one dedicated lab with preparation area and storage should be in place by the end of this period.

**Year 5 Planning:**

We anticipate the need for two (2), finished and fully functional, dedicated labs with preparation areas and storage to accommodate the new certificate and majors program(s).

**Measure C monies should be utilized to provide additional laboratories on the Norco campus. Norco taxpayers agreed to pay additional taxes with the assumption that a fair portion of the money would be spent on their campus. Among the list of items that taxpayers agreed they would be most willing to fund, the addition of science labs was number one on the list.**

### Riverside

The Life Science facilities are old and wholly inadequate and lack a sufficient number of laboratories, classrooms, offices, and storage space. Percent usage of rooms exceeds 85% and is actually greater if one considers student usage of rooms outside of scheduled class times.

Administrators and faculty should discuss how to increase the availability of laboratories and classrooms so that students can study for classes (especially lab courses) outside of scheduled times. The addition of more Biology 96 courses may provide a partial answer to this problem.

Cooling and heating of the building is an ongoing problem. At times it is so cold (even in summer) that students have to wear jackets. At other times, especially in the microbiology lab, it is extremely hot often reaching 95 degrees.

Maintenance of the building is a hit and miss affair. Floor tiles are peeling off the floor, ceiling tiles need to be replaced, carpet needs to be removed and replaced, plumbing constantly needs attention, and seating in LS 108 needs to be repaired. Most rooms have not seen new paint in decades. Requests to the Facilities Dept. often receive less than prompt or adequate attention.

If plans for building new Life Science facilities go forward these problems can be alleviated, although project completion would be 2011 at the earliest.

On the positive side, the Life Science Department recently underwent a minor remodel, adding a dedicated autoclave room, one office, and a room for the network printer. The remodel was undertaken and completed with funds provided by the Office of the Dean and the Office of the Vice Chancellor for Academic Affairs.

## **3. Equipment**

### Moreno Valley

For the most part, the laboratories and classrooms on the Moreno Valley campus are well-equipped. The campus has worked to provide science students with microscopes, models, and other necessary equipment. Computers, which have been provided in both the anatomy and biology labs, are available for student use during laboratory hours. In addition, anatomy faculty and the lab technician have collaborated to create computer tutorials to supplement study in anatomy.

However, the life sciences have steadily increased the number of sections offered in biology, anatomy, and microbiology and have added new

courses such as ecology and cell biology without obtaining a permanent budget increase to guarantee these courses may continue being offered. Each additional lab section that is offered may cost from \$300 to \$2000 per section depending upon the course. The cost of supplies for science laboratory course is inflated each year anywhere from 3 to 5%. This inflationary budget increase is not taken into account and each year when the budget amounts are determined.

Also, with the addition of new faculty and new courses comes a need for a substantial budget increase for the purchase of equipment. New faculty need additional equipment to change and update existing lab exercises. Lab exercises, particularly in the area of biotechnology, are often costly. In order to offer courses for biology majors, such as BIO 11 and 12, the campus will need to purchase items such as spectrophotometers which cost approximately \$1700.00 each. None of these courses can be offered until this equipment is purchased.

It is also anticipated that the autoclave in the microbiology lab will need to be replaced. This could cost as **much as \$70,000 including installation.**

#### Norco

##### **Present:**

Both labs have an adequate number of microscopes, computers, cameras, and projection systems. The Norco Campus also has access to two forms of Tegrity learning technology: the Instructor Cart and the Briefcase (Tablet PC-Based). Both systems are designed to expand web based instruction. It is currently used in two Anatomy classes. There are also three incubators and one new autoclave to serve the needs of the increased number of Microbiology offerings.

##### **Year 2-3 Planning:**

There are numerous pieces of equipment required for the biology majors lab courses. The list includes, but is not limited to spectrophotometers, electrophoresis apparatus, micropipettes, water baths, centrifuges, balances, thermocyclers for PCR analysis, and incubators. A scheduled and progressive plan for replacement of microscopes and computer upgrades will be in place. A teaching microscope should be added to each lab to ensure access for disabled students.

##### **Year 5 Planning**

Replacement of microscopes will be completed. New computers and software will be purchased.

#### Riverside

Equipment needs for science (especially laboratory courses) classes must be constantly monitored. A planned program of turnover should be

implemented so that old and broken equipment can be replaced in an orderly, timely, and cost effective way. Currently, equipment is often pressed beyond its serviceable years making instruction difficult. Purchase of new equipment is most often dictated by crisis rather than by thoughtful planning. As new classes are offered and old courses are revised, new equipment may have to be purchased. The budget line item for supplies has been constant or cut every year for at least the past decade and there is no budget line item for equipment purchase.

Office equipment for faculty offices has been recycled for years. Computers are not replaced on any regular basis and various faculty have experienced costly computer crashes. Even with the addition of new faculty we receive little support from the administration and have to devise some method of providing instructors with technical capabilities.

In spite of these limitations, the department has been able to purchase some equipment including, various pieces for Biology 11, one laptop computer for each of four labs, and a refrigerator for the botany lab.

#### **4. Resources**

There is no consistent allotment of financial resources to the discipline on any campus; therefore it is impossible to plan for the future. The perception is that resources are allocated by the administration based on who can yell the loudest and fight most efficiently for the limited dollars available each year. Sometimes the department is fortunate but oftentimes it is not. When it is not successful, faculty are put in the position of having to decide whether to teach a class with inadequate facilities and/or equipment or canceling the class. Faculty must make it clear to the administrators making decisions the difference between “wish” lists for faculty, equipment, etc., and “necessity” lists.

During the last academic year, the Office of the Dean and the Office of the Vice Chancellor for Academic Affairs collaborated to provide the Riverside Campus with \$50,000 for needed equipment and supplies. This was in response to a plea by the department for equipment money to replace old laboratory models and to purchase specialized equipment for Biology 11. The administrators were given data obtained from the Office of the Chancellor in Sacramento, which showed that the Riverside Community College District was among those colleges who had the least expenditures for Life Science. It further showed that within our own district, the Life Sciences were among the bottom three departments for budgetary expenditures.

## **I. Overall Assessment of Discipline Performance**

The discipline assembled and distributed a questionnaire regarding some of the major issues/goals and the performance of our discipline as a whole. The questionnaire was collected and the results were discussed briefly at a discipline meeting. The discipline members agreed to meet again to discuss the results in more detail after having more time to study the results and offer suggestions for change.

Results of the survey and subsequent discussion will be added to the program review document once completed.

The questionnaire and results are attached as Appendix documents 1 and 2.

## **Topic II. Where do we want to be?**

Based on enrollment trends, community and state needs, and discipline evaluation results, the discipline is in agreement that there are two main areas of focus for the future at all three campuses:

1. The discipline needs to continue striving to develop the means (faculty, equipment, facilities) to supply an adequate number of sections in high demand areas such as Anatomy 2A, Anatomy 2B, Microbiology 1, and Biology 1. In light of the current shortage of nurses statewide and nationwide, RCC will need to direct funding towards the life science discipline in order to accommodate a larger number of students in the prerequisite life science courses.
2. In preparation for the independent operation of three separate campuses, the discipline and college need to develop and institute basic and advanced courses for biology majors. This means an increased focus on those courses already offered at Riverside and the addition of these courses at both Moreno Valley and Norco campuses. The discipline feels these courses must be offered in adequate numbers at all three campuses in order for each campus to become a fully functioning college.

## **Topic III. What do we need to do to get there?**

In order to offer a sufficient number of courses in the areas mentioned above, the discipline will need the following:

1. Support of the college, including administration at the district and campus levels. This includes permanent budgetary adjustments to compensate for the expense of adding additional laboratory courses.
2. Addition of life science faculty, especially at the Moreno Valley and Norco campuses.
3. The addition of more laboratory classrooms and available lecture space for increased offerings in the life science area.

4. Funding for purchase of additional equipment necessary for teaching courses for science majors.

#### **Topic IV. What evidence do we need to track our progress?**

Records of course offerings at each campus in the last five years provide clear evidence that sections of courses in demand (anatomy 2A, 2B and Microbiology 1) have been substantially increased. This increase cannot continue until funding, facilities and faculty provided are adequate for such growth. Should changes occur in the future, these records will continue to provide evidence as to whether the discipline is moving in the direction of their goals.

Additional information such as a waitlist showing the number of students who are unable to register for specific classes would be helpful in determining an accurate number for the number of students who are not being served.

In order to due a more accurate assessment, our discipline needs additional data. Since a large percentage of life science students are taking our courses as a prerequisite for a program, such as nursing, we need the following information:

1. How many students who have taken life sciences courses at RCC are accepted into nursing, physician assistant, dental hygiene, or other vocational programs? (data on transfer rates do not include these individuals)
2. What is the success rate of students in vocational programs (such as those mentioned above) for those students who took their prerequisite life science courses at RCC compared to those who took those same courses at another institution?

In the area of assessment, data collected from the discipline assessment process will be documented by the discipline and files of such evidence will be retained by the discipline facilitator or designee at each campus.

#### **Topic V. How can we improve the discipline self-study process?**

The program review process can be improved by the establishment of an actual review process (at both the campus and district level) that utilizes the program review documents to drive strategic planning and budget.

Currently, only the discipline and a district program review committee read each entire program review document. Decisions for hiring, budget and facility needs are still being made by upper administration without a process that utilizes program review information to rank the needs of the disciplines, campuses and college.

The Program Review Committee should forward recommendations regarding hiring of faculty, equipment and facility needs to both the district and specific site Strategic Planning Committees. The Strategic Planning Committees could then use this information to prioritize allocation and utilization of district and site resources.

## **Topic VI. Summary of Goals, Activities and Findings**

**Goal 1:** Increase the number of courses offered in high demand areas (anatomy 2A, 2B, microbiology, biology) at all three campuses.

### **What is Needed to Reach Goal 1:**

#### **At All Three Campuses:**

- Increase the number of faculty.
- Increase the life science budget to reflect the average expenditure for the science budgets at other colleges with similar enrollment numbers.

#### **Riverside:**

- Focus on building and equipping the new science building.

#### **Moreno Valley and Norco:**

- Build additional laboratory classrooms or remodel existing rooms to provide more labs.
- There are currently no plans to build additional labs at either campus.

**Measure C money should be utilized to provide laboratory rooms for these high demand courses.**

**Goal 2:** Increase the number of courses offered for biology majors at all three campuses.

### **What is Needed to Reach Goal 2:**

- Hiring of additional science faculty at all three campuses, especially Moreno Valley and Norco.
- Provide additional laboratory classrooms at Moreno Valley and Norco.

**APPENDIX**

**Discipline Self Evaluation Questionnaire. . . . . pages 33-34**

**Results of Discipline Self Evaluation. . . . .pages 35-36**

## **LIFE SCIENCE DISCIPLINE SELF EVALUATION**

Please use the following questions using the numbered ranking system below (please use the numbers to denote your answers). Please answer these questions to the best of your ability. Your answers will be confidential, and all results will be tabulated and discussed at the next discipline meeting.

1 - Totally agree      3 – No Opinion      5 – Totally disagree  
2 - Somewhat agree    4 - Somewhat disagree

- \_\_\_\_\_ The life science faculty have the student's best interest at heart.
- \_\_\_\_\_ The life science faculty are more concerned about their own interests, than those of students.
- \_\_\_\_\_ The life science faculty are among the hardest working faculty in the District.
- \_\_\_\_\_ The life science discipline members at all three colleges work cooperatively together.
- \_\_\_\_\_ Life science discipline faculty need to work more closely together among the three colleges.
- \_\_\_\_\_ The life science discipline currently have an adequate number of discipline meetings each semester.
- \_\_\_\_\_ There needs to be more discipline meetings per semester and year.
- \_\_\_\_\_ I enjoy being a member of the life science discipline, and working with fellow life sciences faculty.
- \_\_\_\_\_ I personally think that the department should have more authority in curriculum and hiring issues than the discipline.
- \_\_\_\_\_ For courses offered at all three colleges, curriculum should be coordinated and taught with the same course content among the three colleges.
- \_\_\_\_\_ Faculty at each campus should be given more autonomy to teach any course as they see fit, even if it means that the course is not transferable between colleges.
- \_\_\_\_\_ Lab sections for courses taught at all colleges should be coordinated, so that students receive the same experience within the course, regardless of where they take the course.
- \_\_\_\_\_ Life science discipline members are allowed to have input in decisions regarding curriculum, courses offered, and other topics affecting faculty within the discipline.
- \_\_\_\_\_ My college administration adequately supports the needs and decisions of the life science discipline.
- \_\_\_\_\_ The primary purpose of the life sciences is to prepare students for professional programs (i.e. RN).
- \_\_\_\_\_ The primary purpose of the life sciences is to prepare students for the science majors, and should increase the numbers of science majors courses offered.
- \_\_\_\_\_ The primary purpose of the life sciences is to provide courses for non-science major transfer students.
- \_\_\_\_\_ Faculty should be given sole authority over the choice of textbooks, even if the faculty member chooses not to use a textbook.
- \_\_\_\_\_ Choices of acceptable textbooks should be reviewed and agreed upon by other discipline members.

\_\_\_\_\_ In granting faculty equivalency, all three colleges need to be included.

\_\_\_\_\_ In granting faculty equivalency, each college should have sole discretion in who they grant equivalency, as well as the choice of criteria used.

**PLEASE INCLUDE ANY COMMENTS OR SUGGESTIONS FOR THE DISCIPLINE.**

## LIFE SCIENCE DISCIPLINE SELF EVALUATION SUMMARY

1 - Totally agree    2 - Somewhat agree    3 - No Opinion    4 - Somewhat disagree    5 - Totally disagree

Question #1 - The life science faculty have the student's best interest at heart.

1 - Seven

2 - Four

Question #2 - The life science faculty are more concerned about their own interests, than those of students.

2 - One

3 - One

4 - Two

5 - Seven

Question #3 - The life science faculty are among the hardest working faculty in the District.

1 - Seven

2 - Two

3 - One

4 - One

Question #4 - The life science discipline members at all three colleges work cooperatively together.

1 - Five

2 - Five

4 - One

Question #5 - Life science discipline faculty need to work more closely together among the three colleges.

1 - Three

2 - One

3 - One

4 - Six

Question #6 - The life science discipline currently have an adequate number of discipline meetings each semester.

1 - Eight

2 - Two

5 - One

Question #7 - There needs to be more discipline meetings per semester and year.

1 - One

2 - One

3 - Two

4 - Four

5 - Three

Question #8 - I enjoy being a member of the life science discipline, and working with fellow life sciences faculty.

1 - Nine

2 - One

4 - One

Question #9 - I personally think that the department should have more authority in curriculum and hiring issues than the discipline should.

1 - Two

2 - Two

3 - Three

- 4 – Two
- 5 – Two

Question #10 - For courses offered at all three colleges, curriculum should be coordinated and taught with the same course content among the three colleges.

- 1 – Seven
- 2 – Four

Question #11 - Faculty at each campus should be given more autonomy to teach any course as they see fit, even if it means that the course is not transferable between colleges.

- 2 – One
- 4 – Four
- 5 – Six

Question #12 - Lab sections for courses taught at all colleges should be coordinated, so that students receive the same experience within the course, regardless of where they take the course.

- 1 – Three
- 2 – Five
- 4 – One
- 5 – Two

Question #13 - Life science discipline members are allowed to have input in decisions regarding curriculum, courses offered, and other topics affecting faculty within the discipline.

- 1 – Eight
- 2 – Two
- 4 – One

Question #14 - My college administration adequately supports the needs and decisions of the life science discipline.

- 1 – Two
- 2 – Three
- 3 – Two
- 4 – Three

Question #15 - The primary purpose of the life sciences is to prepare students for professional programs (i.e. RN).

- 1 – One
- 2 – Two
- 3 – One
- 4 – Five
- 5 – Two

Question #16 - The primary purpose of the life sciences is to prepare students for the science majors, and should increase the numbers of science majors courses offered.

- 1 – Four
- 2 – Three
- 3 – One
- 4 – Two
- 5 – One

Question #17 - The primary purpose of the life sciences is to provide courses for non-science major transfer students.

- 1 – Two
- 2 – Two
- 3 – Two
- 4 – Three

5 – Two

Question #18 - Faculty should be given sole authority over the choice of textbooks, even if the faculty member chooses not to use a textbook.

1 – Three

2 – Three

3 – One

5 – Four

Question #19 - Choices of acceptable textbooks should be reviewed and agreed upon by other discipline members.

1 – Six

2 – Three

4 – One

5 - One

Question #20 - In granting faculty equivalency, all three colleges need to be included.

8 – Eight

2 – Two

4 – One

Question #21 - In granting faculty equivalency, each college should have sole discretion in who they grant equivalency, as well as the choice of criteria used.

2 – One

3 – One

4 – Four

5 - Five