



# MERRITT COLLEGE

*OFFICE OF THE DEAN OF INSTRUCTION*



## **SUMMARY OF PROGRAM REVIEW: Biology/Microbiology, Microscopy, Genomics, Master Naturalist**

*March 2010*

by Rebecca Kenney, Ph.D, Dean of Mathematics, Science, & CTE Programs

Our Merritt College mission is to provide program-based instruction, educate, and train students on cutting-edge equipment, to become viable candidates for fulfilling careers in high growth, high tech biotechnology and healthcare fields including Nursing, Radiological Sciences, Microscopy, Genomics, Histopathology, and related fields.

Using evolution as our paradigm, we also wish to promote natural history both locally and internationally and to develop a Master Naturalist Certification. To support this effort, we plan to develop a naturalist website, which will further assist our Biology and Bioscience students as well as those in the Environmental Sciences.

As our data indicates, we have a strong history of maintaining and increasing enrollments.

For Genomics and Microscopy our goals are to do the following:

- A) Develop financially self-sustaining programs that include opportunities for student research.
- B) Establish and maintain partnerships with local, national, and international institutions, business & industry, community agencies, and field-related corporations that can provide employment and support.
- C) Develop production facilities which will generate income for the program.

We are the only community college west of the Mississippi that offers a Certificate in Fluorescence and Confocal Microscopy, as well as a Certificate in Genomics. As such, these programs require sophisticated equipment and a wet lab for Genomics. To support the fiscal needs for this equipment and consumables, we are currently using several sources of funding for these programs including the University of California Extension Fund which was previously blocked from us. This fund can also be used for research, staff development and student assistance. Additional sources of funding for replacing models, slides etc. should be pursued. This year we received a totally inadequate supply budget (the same as Speech) and this is not sufficient to support our programs. We are relying on our current equipment and we need funding to replace and augment it as needed.

- **CURRICULUM**

The courses are current and effective. Course outlines were all updated this year. Since spring 2009, all courses submitted to the College Instruction Committee for creation and updates have incorporated Student Learning Outcomes. Pre-requisites, co-requisites and advisories for all other classes have been validated.

Outcomes have been developed at the program level and standardized district wide in Chemistry. Student learning outcomes are included in course outlines, course syllabi, and content is taught to emphasize them. All courses have student learning outcomes associated with them. New preparatory courses, Beginning Chemistry I and II have been proposed for the 2010-2011 academic year. This will be a yearlong introductory Chemistry course aimed at preparing students to take college level Chemistry (Chem1A and Chem1B).

- **INSTRUCTION:**

Small group learning and active participation through use of engaging pedagogical strategies, practices, and use of appropriate technology are strongly encouraged in the classroom. Students are required to participate in laboratory sections that are expertly set up by a full-time lab technician and qualified faculty members. Class, course, or instructor websites have been and are developed, updated, and used by individual faculty members to provide differing options for student to experience online study groups and student-to-student interaction. The Chemistry Department meets on a regular basis to discuss course content; these meetings take place both on a college- and district-wide level. Work is currently being done to develop assessment tools that will be utilized by all sections of a given course at this location.

Enrollment has been constant during the last five years. All classes are enrolled at or close to capacity every semester. These classes are integral to health and medical degree programs including Nursing, Nutrition, Physical Therapy, Physician Assistant, Veterinarian, Optometry, Dentistry, Pharmacy, etc.

Courses are always in demand and are offered on multiple days both in the morning and evening. Class times at this location are coordinated with class times on other Peralta District campuses to assure students have a variety of Chemistry course content options offered at different times, on different days, and rotating different semesters. Courses are consistently filled to capacity indicating that student demand is constant.

- **STUDENT SUCCESS:**

The student retention rates in the program are 10% lower than the college average. This is primarily due to the difficulty of the subject and the lack of a foundation in Mathematics. To address this pattern of deficiency, the Chemistry department has started a Supplemental Instruction program, which has shown to improve retention rates.

Students need a stronger foundation in Mathematics, an adequate number of tutors, and a support group to encourage group learning and study skills. The Chemistry Department has tried to incorporate Supplemental Instruction into all classes, but financial support has not allowed this.

The Chemistry Department is currently working with SLOAC to develop a rigorous set of assessment tools for all courses. Introductory Inorganic Chemistry (Chem30A), as the largest

course offering, will develop assessment tools during the spring 2010 semester with other courses to follow.

- **RESOURCES:**

**Staffing**

There are two full-time faculty members, five part-time faculty, and one classified staff member, a Chemistry Lab Technician.

The human and physical resources are adequate for the courses offered at this time. As the program is expanding, student aides to assist in laboratory preparation will be required. New labs, storeroom, instrument room, computer lab and furniture are needed and will be supplied by the new building. There is a need for more Meltemps and Vernier equipment.

**Facilities**

We have three laboratory rooms: one for Introductory Chemistry (Chem30A/30B), one for general Chemistry (Chem1A/Chem1B), and one for organic Chemistry (Chem12A/12B). There is a Chemistry study room with eight computers that were denoted to the department; this room is used on a daily basis for student study groups, tutoring sessions, and Supplemental Instruction. The program has a single laptop and projector, which are utilized in lecture courses. The program has numerous analytical instruments such as NMR, AA, IR, UV-Vis and Meltemps. We use the Vernier system for pH meters, conductivity meters and other similar instrumentation.

Building D is old. Second (2nd) level restrooms are inadequate (toilets do not flush, HVAC does not work). Second level classrooms have limited connectivity and no projection capability. New student and faculty furniture are needed in classrooms and offices. Faculty offices are inadequate—lack of book shelves, definition of personal space, crumbling ceilings, ventilation issues, cracked concrete ceilings and walls, old, chipping paint, ground-in filth layered under years of floor wax.

A brand new Science and Allied Health, \$60 million dollar, 75K sqf building is currently being designed and is expected to be occupied within 3 years. The Chemistry Department is actively taking part in the Steering Committee and cluster focus groups to contribute to the design and build of this new instructional space that is sorely needed and anxiously awaited.

- **COMMUNITY OUTREACH AND ARTICULATION:**

Faculty members attend seminars, workshops and conferences with other Chemistry faculty members District and State-wide. The Chemistry Program is adequately preparing students for upper division course work. Evidence of whether students are well prepared for their next academic experience or for the workplace is calculated anecdotally via documenting the experience that numerous former students' provide us when they stop by every year and tell us in person that they feel they were well prepared through their teaching and learning experience per the Chemistry instructors, staff, facilities, equipment, and materials provided them.

Chem30A is offered instead of Chem1A/1B and Chem30B is offered instead of Chem12A/12B for Nursing and Allied Health students.

- **RECOMMENDATIONS**

- Repairs all air, gas, and water pipes including aspirators (Station Vacuums)
- Repair 2nd Level Building D restrooms (broken stalls, vandalized mirrors, graffiti)
- Add Electrical Power to computer lab and 8 new computers for Chemistry Computer Lab
- Replace approximately 12 Chairs and 8, 4' tables in computer lab
- Complete Program Level mapping and SLOs for all Chemistry Department degree/certificate programs by the end of Fall 2010.
- Complete course outline and SLO's for new preparatory courses, Beginning Chemistry I and II proposed for the 2010-2011 academic year. This will be a yearlong introductory Chemistry course aimed at preparing students to take college level Chemistry (Chem1A and Chem1B).
- Seek improved coordination with Learning Center for tutorial services.
- Establish Student Learning Communities with Mathematics Departments for Chemistry Students.
- Seek and apply for funding sources to support faculty efforts to develop new programs and meet workforce trends.