

The Instructional Program Review Narrative Report

1. College: Merritt College

Discipline, Department or Program: Biology/Microbiology, Microscopy, Genomics, Master Naturalist

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Members of the Instructional Program Review Team: Hank Fabian, Arja McCray, Melinda Downing, Nancy Rauch, Steven Scott

2. Narrative Description of the Discipline, Department or Program:

Please provide a general statement of primary goals and objectives of the discipline, department or program. Include any unique characteristics, degrees and certificates the program or department currently offers, concerns or trends affecting the discipline, department or program, and any significant changes or needs anticipated in the next three years.

We provide program-based instruction and train students on cutting-edge equipment so as to provide access to fulfilling careers in high growth, high tech fields of medical, 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. We also plan to develop a naturalist website which will assist our students as well as those in Environmental Sciences.

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

For Genomics and Microscopy our goals are to

A) Develop financially self-sustaining programs that include opportunities for student research.

B) Establish and maintain partnerships with local, national, and international institutions, agencies, and 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 and in Genomics. As such, we need sophisticated

equipment and a wet lab for genomics. In addition we need to tap into our source of funding for these programs which is the UC 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.

3. Curriculum:

- Is the curriculum current and effective? Have course outlines been updated within the last three years? If not, what plans are in place to remedy this?

Students have reported back from 4 year schools in Allied Health programs that their instruction from our classes prepared them well. We have students go on prestigious schools – including Johns Hopkins, Columbia University, SF State and Samuel Merritt. Our classes are taught using highly acclaimed textbooks which help guarantee the current curriculum is up-to-date and effective.

- Has your department conducted a curriculum review of course outlines? If not, what are the plans to remedy this?

Yes, we are currently doing this.

- What are the department's plans for curriculum improvement (i.e., courses to be developed, updated, enhanced, or deactivated)? Have prerequisites, co-requisites, and advisories been validated? Is the date of validation on the course outline?

Yes, prerequisites have been validated but not enforced until recently. We will develop a course "Learning to Learn" or a science study skills course. We are also looking at developing online or hybrid classes. We have not found a course outline without a date of validation.

- What steps has the department taken to incorporate student learning outcomes in the curriculum? Are outcomes set for each course? If not, which courses do not have outcomes?

We are developing Student Learning Outcomes but the majority of our major classes have had them submitted. All of our new curricula are current.

- Describe the efforts to develop outcomes at the program level. In which ways do these outcomes align with the institutional outcomes?

INSTITUTIONAL LEARNING OUTCOMES COMMUNICATION

Communicate with clarity and precision using oral, nonverbal, and/or written language, expressing an awareness of audience, situation, and purpose.

Our courses are designed for people to interact with one another. We encourage people to work in teams and to tutor each other. In addition most of our courses have essays or short answer questions that we require from the students.

CRITICAL THINKING

Think critically using appropriate methods of reasoning to evaluate ideas and identify and investigate problems and to develop creative and practical solutions to issues that arise in workplaces, institutions, and local and global communities.

We give students clinical problems that they have to assess or we give them models or illustrations that they haven't seen before that they have to interpret. Some component of our exams requires demonstration of critical thinking.

QUANTITATIVE REASONING

Apply college-level mathematical reasoning to analyze and explain real world issues and to interpret and construct graphs, charts, and tables.

Many of our courses use calculations and require students to interpret data and graphs.

CULTURAL AWARENESS

Through a knowledge of history and cultural diversity, recognize and value perspectives and contributions that persons of diverse backgrounds bring to multicultural settings and respond constructively to issues that arise out of human diversity on both the local and the global level.

We encourage our students to work together. Our courses teach the biological aspects of diversity. We teach the true meaning of human diversity and explain that there is no biological thing as race as variation within human populations is greater than the variation between populations. We also teach the similarities of DNA.

CIVIC ENGAGEMENT AND ETHICS

Internalize and exhibit ethical values and behaviors that address self- respect and respect for

others with integrity and honesty that will enable success and participation in the larger society.

We encourage ethical behavior. We discourage academic dishonesty. We treat all students in our classes with respect and concern.

INFORMATION AND COMPUTER LITERACY

Use appropriate technology to identify, locate, evaluate and present information for personal, educational and workplace goal

We have developed websites, YouTube videos, PowerPoint presentations, and use computer programs for teaching many aspects of biology.

- Recommendations and priorities.

Evaluate business procedures and streamline processes for accounts payable and receivable and ordering materials in a timely manner. We need a wet lab for genomics. Without a wet lab genomics cannot run. We need to create a system whereby genomics and microscopy can become self-sustaining. Develop a more efficient system in the lab for prioritizing our greatest needs and for ordering. Order more equipment for physiology labs and upgrade the physiology labs. More computers. Genomics needs multiple sequencers and a server and a dedicated lab. We need timely turnover of cadavers. We need stable funding. We want to continue to develop our relationship with UC Extension so we can expand our course offerings and make sure we are meeting their needs.

4. Instruction:

- Describe effective and innovative strategies used by faculty to involve students in the learning process. How has new technology been used by the department to improve student learning?

Our students use computer simulations and collect physiological data. We have YouTube videos of lectures. We show animations in our classes, some of which we get from the internet. We use cameras attached to our microscopes to display histological images on a screen for the whole class. Some classes have been videotaped and the DVDs are available at the Reserve desk at the Library. Online course development is underway. Some of us maintain course websites for many of our classes. DVDs of presentations are given in some classes.

- How does the department maintain the integrity and consistency of academic standards within the discipline?

We mentor our adjunct instructors, share instructional materials and we evaluate our adjuncts regularly.

- Discuss the enrollment trends of your department. What is the student demand for specific courses? How do you know? What do you think are the salient trends affecting enrollments?

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Data demonstrates that our enrollment in the sciences continues to be very strong. We are maintaining and increasing enrollment yearly. In spite of the fact that other schools are getting new buildings, we are the only campus that is building new programs to occupy new buildings. Rather than cut sections, we must maintain high productivity and growth to justify the new Health Sciences building which will probably house not only Biology but also Microscopy, Genomics, and Histopathology programs. As Biology is one of the main arteries for student advancement, decreasing enrollment in biology will automatically decrease enrollment in other departments. It is therefore necessary that we at least maintain if not grow our department over the next three years. An ideal growth pattern would be 10% FTES, with added sections to accommodate this growth, each semester.

Allied health has driven our enrollments because our courses are prerequisites for many Allied Health programs. We have opened more sections as a result of the student demands. We have gained more part-time students, which has increased our class sizes. More courses are being offered at our sister campuses, following Merritt's lead, diluting our pool of students. At the same time, we have lost some of our part time instructors. However, because Merritt is offering new degree programs, we anticipate growth. Furthermore, schools are cutting back on courses across the board which gives Merritt an opportunity for growth once again.

Are courses scheduled in a manner that meets student needs and demand? How do you know?

We offer evening sections in most of the classes we teach in addition to daytime sections. We offer early morning classes as well as afternoon classes. Most of our classes meet twice a week, which leaves more days available to students for work or minimal childcare.

- Recommendations and priorities.

Decrease maximum class size number, and keep it consistent from semester to semester, having it reflect the number of students who can be adequately served given the resources available. Previously the class maximum has varied from semester to semester, sometimes filling up classes with more students than is safe for the room and instructor's ability to supervise. When student interest exceeds the maximum class size number, we request that the administration support our establishing additional sections to meet that need.

5. Student Success:

- Describe student retention and program completion (degrees, certificates, persistence). Persistence rates trends in the department. What initiatives can the department take to improve retention and completion rates?

We are well above the college average in terms of student retention. In addition, our biology retention rate has increased. Our average completion rate is higher than the college average. Our classes feed into vocational programs that lead to well-paying careers. This gives students a high motivation.

- What are the key needs of students that affect their learning? What services are needed for these students to improve their learning? Describe the department's efforts to access these services. What are your department's instructional support needs?

The tutoring center is very important to our students. We need to ensure that there are at least three biology tutors in the Student Learning Center each semester, including two tutors well versed in Anatomy, Physiology, and Microbiology. We need more support for our special needs students. A significant number of our DSPS students have reported dissatisfaction with the level of support offered through the DSPS office, particularly note takers, lack of flexibility in scheduling testing accommodation and a testing environment that is not conducive to their needs. This reflects the need for additional funding and staffing for that office. Student Learning Center should have the resources and staffing to maintain a safe, secure location for histology slides, microscopes and models to be available for students' study. Theft in the Learning Center has occurred several times.

- Describe the department's effort to assess student learning at the course level. Describe the efforts to assess student learning at the program level. In which ways has the department used student learning assessment results for improvement?

Most of our classes administer comprehensive final examinations, which assesses at the course level. Our department is currently developing a program-level assessment plan. For the Microbiology and Anatomy programs within our cluster, students must first begin their study with Biology 10, Introduction to Biology, our basic biology survey course. Students stair-step from this course to more advanced biology courses.

- Recommendations and priorities.

Increase funding for the DSPS department and for the Learning Center, especially tutors, equipment and security.

6. Human and Physical Resources (including equipment and facilities)

- Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment.

We currently have five full time faculty in the Biology/Biosciences cluster. We are requesting two additional full time faculty to bring the total to seven. We currently have about twenty

adjuncts, and this number varies significantly from semester to semester. We have two classified full-time laboratory technician positions. One is on medical leave but is not returning, so the responsibilities of that position are currently being performed by a temporary employee. We will need to find a permanent technician when the terms of that temporary contract expire. One of our full-time instructors recently retired, and we have lost some of our part-time instructors, in spite of the fact that our enrollment is up. We therefore request that we hire at least two new instructors over the next three years.

- Describe your current utilization of facilities and equipment. Projects, laptops, computer labs,

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We currently occupy six laboratory rooms and two stockrooms. We have 16 antiquated computers. Our adjunct faculty members are using outdated Thinkpads and other laptops. We have six LCD projectors for instructor use, which is inadequate. We need more computers and LCD projectors for our adjunct instructors' use, since the Merritt College campus does not supply this equipment for adjunct faculty. The campus has also been remiss in replacing lost and old computer equipment for full time faculty use. We also need a walk-in cold room and big autoclave for our microbiology courses, and service contracts to maintain this equipment. We need to maintain and increase the models for our Biology classes as well as computer programs and data collecting systems. Genomics and Microscopy Programs need wet labs. Genomics needs to start the program in modules and will require additional sequencers, computer servers and auxiliary equipment. Microscopy needs equipment for teaching histoprep and cell culture.

We need more computers for our anatomy/physiology courses and we will need service contracts to maintain these computers.

We will need a state of the art science building that will support dedicated spaces for biology. The dedicated space must be fitted with air, water, vacuum and gas lines. The space should be "smart rooms" due to the type of exciting and modern technology that will be taught in each course.

We should also prepare the building for marine biology courses that will require the use of large aquariums and terrariums since we do plan on introducing and developing a marine biology program.

We will need up-to-date software and hardware for our physiology laboratory courses. Our A/P courses use these computers to simulate processes in the human body. These computers are vital and instrumental to teaching an excellent anatomy/physiology course. The anatomy/physiology program should have dedicated lab space that accommodates cadavers, and the dissection of the cadavers. The cadaver room should have adequate ventilation for safety and health concerns.

This state of the art science building should also be able to accommodate a progressive microbiology program. In the future, we (our biology dept.), would like to offer a microbiology program that not only trains future allied health professionals but also trains lab technicians and assistants. The building should have a dedicated microbiology lab space that has a couple of culture hoods and can host equipment such as polymerase chain reactors and gel electrophoresis boxes. In addition, the microbiology space should have all the amenities much earlier with dedicated spaces for our other science programs.

We need display areas for living organisms in the hallways and classrooms. Living organisms bring biology to life!

We will continue to develop the Merritt Microscopy and Genomics programs as outlined in our strategic plans and in response to industry needs.

1. **Bioscience Coordinator** position is needed to oversee the goals, structure, marketing, grants, production labs, outreach, research, development, strategic planning, staffing, faculty recruitment, contract education, budget, and facilities of all Bioscience Programs within Merritt College. The Coordinator would also coordinate directors of the programs listed below and work in conjunction with directors to ensure optimum lab production and student success.
2. **Director positions** for each program are needed to manage the specific needs of each program, as outlined below.
3. **Facilities** needs are urgent and include: tissue culture lab, microscope rooms, and all genomics labs. Some of this will be accomplished through room renovations in building D, and through initial localization of equipment in the district-owned 860 Atlantic biotech building. The new Merritt College Science building will include genomics and microscopy facilities.
4. **Technical support** is vital to these programs. We are in need of full-time and part-time technicians in order to offer open lab time for student training and study and in order to maintain the equipment.
5. Creation of pedagogical **training pods** is planned, for appropriate lab courses. These pods would allow students to work in small groups with lab professionals for shadowing and ultimately hands-on proficiency training. Lab professionals will receive stipends and/or access to equipment.
6. Pedagogically, it is important for students to have **access** to the equipment at all times. The programs are based on hands-on training, and the students are required to spend many hours every day working on the equipment. Facility (e.g. extended building hours) and technical support (e.g. lab technicians) is essential in order to accomplish this training.
7. Development of **on-line courses** for appropriate lectures that would include discussions with leading scientists and technicians as well as animations as an outreach component of the program.
8. **Grant writer** is needed to assist in obtaining funding from numerous funding opportunities, including NSF grants, NIH Bridges grants, MARC NIH funding, NIH Area grants, Genentech, CA State Chancellor's office Biotech funding, CTE funding and others.
9. **Counselor** for internship development and employment placement is needed.
10. Student **scholarships** are needed for internships, conferences, books, tuition and supplies, as well as cost-of-living stipends for select students.
11. **Finance officer** is needed to manage purchasing and budgets, including grant funds and funds obtained from lab production, contract education, and equipment usage.

12. **Administrative manager** and CTE specialist is needed to interface with Merritt College administration, Peralta district, other Peralta Colleges, state and nationwide community colleges, CA Chancellor's office.

13. **Intra-district collaborations** are in place with COA and with Laney College Bio-manufacturing program.

14. **Contract education** is planned: This will be a vital source of revenue and also a good marketing tool.

15. **Paid community use** of equipment is planned: This will be a strong revenue source, plus training and networking opportunity for our students.

16. **Partnerships** with local and international institutions include the California Academy of Sciences, SFSU and the MMP advisory board.

17. Recruitment of **international students** is underway.

18. **Marketing** efforts are underway in a variety of formats, including online, flyers, brochures, course catalogue, local listserves, professional conferences, open houses.

19. **Outreach** efforts include contact with a variety of local health organizations and biotech companies and with local Middle and High Schools.

20. Development of a **Histopathology Program** would be beneficial, due to the high demand for trained histopathologists. This would require hiring a director to develop the curriculum, industry partnerships, and to oversee the purchasing and marketing, and to recruit qualified faculty. Qualified and interested instructors have already been identified.

21. Likewise, development of an **Electron Microscopy Program (EM)** would be beneficial, due to the high demand in the Bay Area for qualified EM technicians. This would require hiring a director to develop the program. Qualified and interested instructors have already been identified for this program, too.

22. Trained operators of **high-throughput screening (HTS)** systems are in high demand in Bay Area biotech companies. This is another program that would be beneficial to develop, and would require the hiring of a specialized director. HTS systems use robotics and microscopy, so, like the aforementioned possible directions, this possible program is also a natural fit for Merritt College.

23. Establish a district account that allows fast turnover of accounts payable and receivable. It is imperative that all bioscience programs function as businesses if they are to generate their own capital. Separate accounts for each program might be establish and built in tandem with the

newly managed Merritt College Business Office.

Summary: Genomics is high throughput genetics and the fastest growing area of biotechnology, encompassing cancer research, drug discovery, forensics, agriculture and horticulture, evolutionary biology, epidemiology, tracking and exploitation of endangered species and general health awareness. This area of science relies heavily on computational manipulation of DNA sequences and drives many areas of informatics. The Bay Area is the world's leader in both biotechnology and informatics. Hence, there is a great need in the Bay Area for training in Genomics. Developing a Genomics program at Merritt College launches our campus into the 21st century. At the time of this writing, our program is unique, unmatched by any community college world wide.

- Are the human and physical resources, including equipment and location, adequate for all the courses offered by your department (or program)? What are your key staffing and facilities needs for the next three years? Why?

As with all departments, we will need more equipment, material and supply funds to be prepared for the expected increase in our enrollments. In addition and to help our faculty, we will need additional money funding for student assistants and tutors. Furthermore, we will need the support of another full-time lab and a lab assistant to help improve the quality and quantity of science classes that we offer.

Our current student enrollment exceeds the current laboratory space we have, preventing us from teaching the appropriate number of students in a laboratory section. Genomics and Microscopy both need wet labs. Genomics wet lab classes have yet to start due to inadequate space.

We will definitely need increased funding to continue presenting, to our students, an academic environment that is enriching, stimulating and challenging. This increased funding will be used to purchase state of the art supplies and equipment to produce very erudite students.

We will require a webpage and or website for Bay Area Natural History as well as for other biology lectures including Human Anatomy and/or Physiology courses. We are exploring the idea of hybrid (web/classroom) courses and will require release time for developing said courses.

Immediate needs include:

- 1) Establish **Director** positions for Microscopy- and Genomics specific strategic planning, marketing, outreach, grant writing and administration, advisory board coordination and recruitment, contract education, paid equipment usage coordination, curriculum coordination, updating and scheduling, equipment management and maintenance, recruitment, scheduling and mentorship of faculty, student issues, budget, purchasing, staffing, internship development and coordination, job development, campus and community relations and communications, shared governance, organization of student and faculty research, development of sponsorships, donations and partnerships.
- 2) Hire a full-time **technician** or two part-time technicians to calibrate and maintain the

equipment.

- 3) **Facilities:** tissue culture lab, IHC lab, microscopy rooms.

Plans for the program include:

- a) Establishment of the Bay Area Microscopy Consortium (**BAMC**): monthly talks that showcase our students, and local microscopists and their work. The BAMC is also a good networking opportunity and will result in increased student employment, collaborations and grant writing opportunities.
- b) Establish AS or AA **degree** in Bioscience Microscopy.
- c) Student **scholarships:** funds for conferences, internships, tuition, living expenses.
- d) **Grants**, if release time is obtained, or a grant writer is hired, we can complete the \$2 million Bridges to Baccalaureate grant, investigate and apply for other grants, including Area grants, NSF supplemental funds, Genentech, State Chancellor's Biotech grants.
- e) Continue to work with Advisory Board.
- f) Continue to develop curriculum.
- g) Continue to recruit and employ qualified adjunct faculty.
- h) Continue to teach many sections of biosci 1 ("feeder course"), plus program courses. Overlapping program cohorts may be scheduled.
- i) Continue to attend professional conferences with students.
- j) Continue to develop and oversee internships.
- k) Continue to maintain and manage equipment.
- l) **Outreach** will include 14 visits to local middle and High Schools, plus several on-site events ("Meet the microscopist") through the district-wide multimedia CTE grant.
- m) **Contract ed:** there is already a demand for contract courses using our equipment. We require a coordinator to activate this part of the program.
- n) **Equipment usage** by local scientists: there are already requests to use the imaging systems, but we require an imaging core coordinator to manage the scheduling, maintenance, and budget. Local recharge rates are \$100/hour for this kind of equipment.
- o) **Marketing** includes brochures, ads, websites, flyers, open houses.
- p) Develop local and international **sponsorships and partnerships.**
- q) Continue to solicit equipment donations.
- r) Develop student and faculty **research** using MMP resources.
- s) Continue to manage and maintain facilities, budget, equipment, and other MMP resources.
- t) Improve **facilities**, including remodeling of D building rooms and, if possible, space in 860 Atlantic biotech building (or portables, or leased space). Eventually, we will be located in the new Merritt Science Building.

Merritt Genomics Program

Establish **Director** position for Genomics specific strategic planning, marketing, outreach, grant writing and administration, advisory board coordination and recruitment, contract education, paid equipment usage coordination, curriculum coordination, updating and scheduling, equipment management and maintenance, recruitment, scheduling and mentorship of faculty, student issues, budget, purchasing, staffing, internship development and coordination, job development, campus and community relations and communications, shared governance, organization of student and faculty research, development of sponsorships, donations and partnerships. In addition, we plan to work with higher educational institutions for student training and we will develop cooperative relationships to this end.

Hire full time and part-time technicians who will help to maintain instruments and laboratory conditions and potentially train students and faculty. In addition, one or more technicians will be involved in set up and maintenance of computer systems involved in data analysis and tracking of projects.

Develop and teach courses in data analysis, micro array, colony picking, capillary sequencing, next generation sequencing, Bac-library production and related areas. Inclusive in these courses will be training in good laboratory practices, data organization, tracking projects using bar-coding, scientific presentation, research and experimental design and scientific writing, grant writing, and scientific publication.

Genomics will also create a **production facility** which will help to pay for consumables, staffing, and equipment. This production facility will be driven by fee-based data analysis and collection from external sources as well as grants. This is a unique approach in industrial training because it mirrors industrial level biotechnology and government facilities to exemplify high-throughput data collection and management. We wish to establish this facility immediately to create an alternative funding source that will help launch the Genomics Program prior to going to 860 Atlantic Avenue. We wish to establish an alternative funding source in tandem with the Merritt Business Office that is accessible per current and established law, policy, and regulations.

Pods will be taught by graduate students, post docs and scientists who wish to use our facilities but who will provide training to small groups of students in return.

Genomics will first establish itself at the district owned, **860 Atlantic Building**, which must be renovated to accommodate the equipment we current own and will potentially acquire. Ultimately, a new Genomics Center will be created at Merritt College as part of the overall campus renovation.

Online courses will use You Tube or similar resources that will be accessible only to Merritt students enrolled in the Genomics program.

Grants: Immediately apply for ABI consumables grant and rewrite NSF grant with San Francisco State University. Grants will be for consumables, travel, stipends, student and faculty

research, equipment, and hiring of support staff such as lab techs and lab instructors.

Establish and maintain national and international partnerships with genome centers and universities. We currently have working relationships with a number of local, national and international institutions and corporations. These relationships will provide a variety of avenues for attracting potential students, graduate student trainers, and facilitating partnerships that may lead to grants for consumables and equipment.

- Recommendations and priorities.
 - Our major priorities are:
 - Wet lab for Genomics.
 - Cell culture lab for Microscopy.
 - Purchase of at least five sequencers and an adequate server for Genomics.
 - More Biology lab classrooms.
 - More models and supplies for Biology.
 - Computerized equipment for data collection.
 - Technicians for Microscopy and Genomics.
 - At least one more part-time technician for Biology.
 - Purchaser for all Biology and Bioscience programs.
 - Histoprep equipment for Microscopy.
 - Up-to- date computers for all of our programs and projection equipment.
 - Hiring more full-time instructors for all our programs.
 - Faculty release time for developing and running programs.
 - Research funds for student projects including transportation.
 - Grant writer specializing in scientific grants.
 - Ergonomically sound offices and furniture.
 - Adequate office space for adjunct faculty.
 - Conference room.
 - Expanded stockroom.
 - Room for exhibits (museum).
 - Walk-in cold room for Microbiology.
 - Greenhouse facility for growing plants for various biology courses.

7. Community Outreach and Articulation

For vocational programs:

- Describe the department's connection with industry. Is there an Advisory Board or Advisory Committee for the program? If so, how often does it meet? Is the program adequately preparing students for careers in the field? How do you know?

The Microscopy Program was developed with guidance from industry and academic partners (focus group, then Advisory Board), and in response to other market research, including data from EDD. Labor forecasts indicate a strong current and future demand. This is corroborated by feedback from the industry, as well as information gathered at several professional meetings this year. The Advisory Board meets at least once a semester.

- Have students completing the program attained a foundation of technical and career skills? How do you know? What are the completion rates in your program?

As evidenced by their success in various internships, Microscopy students have attained a solid foundation of skill in operating and maintaining fluorescence and confocal microscopes. Genomics is a nascent program for which there are no completion data available.

- What are the employment placement rates? Include a description of job titles and salaries. What is the relationship between completion rates and employment rates?

We have all written many letters of recommendations to numerous nursing programs for our students, and have received positive feedback about their acceptance to such programs.

- What industry trends are most critical for the future viability of the program? How do you know? What are the implications of these trends for curriculum development and improvement?

There is a projected health care shortage. Rangers can be trained in our Natural History Program. Genomics and Microscopy are growing areas and Merritt College is the first college in the Bay Area to address these needs. All of our program areas show potential for jobs for students in areas that will need more workers.

For transfer programs:

- Describe the department's efforts in meeting with and collaborating with local 4-year institutions. Is the program adequately preparing students for upper division course work? How do you know?

All our courses transfer to four year schools except for fee based and experimental courses. Some natural history courses may still require transfer status.

Students who have transferred to UC Berkeley have come back and told us that they were exceptionally well prepared for upper division classes there. We work closely with UC Extension and the state colleges and universities so that our classes are acceptable for transfer credit.

For all instructional programs:

- Describe the department's effort to ensure that the curriculum responds to the needs of the constituencies that it serves.

We have held interdisciplinary meetings with Merritt College instructors and program directors in the Nursing, Radiological Technology, and Medical Assistant programs, to discuss curriculum. Our Microbiology Department has formed a consortium with the Nursing Department to ensure that potential nursing students are receiving adequate educational tools to make them competitive in the nursing program.

- Recommendations and priorities.

Maintain articulation agreements with local four year schools. Maintain relationship with UC Berkeley Extension. Maintain relationships with industry via our advisory boards for Genomics and Microscopy. Maintain relationships with local and state parks. Maintain relationships with the health care industry and work closely with the Allied Health department at Merritt College.