

Instructional Program Review 2006-2007
Biotechnology Certificate Program

Faculty Contact Person: Mark Barnby

Team Members:

Yvette Niccolls

Anu Suresh

1. Program Description and Scope:

- The Biotechnology Certificate Program at Ohlone College is designed to prepare students with practical laboratory skills and the theoretical knowledge needed for entry-level jobs in the local biotechnology industry.
- The Biotechnology industry, in part centered in the San Francisco Bay Area, has an increasing demand for a skilled workforce. Ohlone and other community colleges, are helping to train this workforce by providing the needed laboratory, documentation, and instrumentation skills to work in biotechnology. As biotechnology evolves, the Biotechnology Certificate Program at Ohlone College responds by upgrading its curriculum to meet job demands of the industry. Ohlone College's Biotechnology Certificate Program is currently re-designing the biotechnology curriculum into a shorter (2 semesters vs. 3 semesters), modular (topic-specific courses that will permit students to acquire specific skills and knowledge on a need-to-know basis) program that will prepare new students for entry-level jobs, as well as upgrade the skills of incumbent workers in biotechnology.

2. Relationship to Ohlone College Mission and Goals:

- The Biotechnology Certificate Program at Ohlone College offers life-long learning opportunities to all members of the community, including those wishing to acquire the training and knowledge to enter the biotechnology workforce, and incumbent employees that wish to upgrade their skills for job advancement.
- The Biotechnology Certificate Program will directly benefit the economic environment of Fremont and the South Bay by providing a well-trained workforce that can meet the demands of our local biotechnology industry. This keeps local people employed, and makes it easier for local firms to remain local.
- The Biotechnology Certificate Program has been able to enhance the quality of instruction in other departments (e.g., Biology and Chemistry) via its acquisition of instrumentation and activities through a variety of strategies including faculty-sought donations and grants.

3. Student Learning Outcomes:

- The student will:
 - 1) Discuss and practice proper laboratory safety procedures, laboratory etiquette, biosafety, and bioethics.
 - 2) Comprehend the need for proper documentation in the biotechnology laboratory environment, and demonstrate the proper methods of documentation by creating and maintaining laboratory notebooks and other relevant documents.

3) Apply the scientific method, good experimental design, and operate with scientific integrity in all scientific investigations.

4) Employ the correct mathematical rules of operation, and be able to apply these to the preparation of reagents, buffers, pH adjustments, etc.

5) Recognize the key theoretical concepts in molecular biology and biotechnology as they relate to the biotechnology industry, and to assess and evaluate current and future trends in biotechnology.

6) Employ gained knowledge and skills in the use of instrumentation and techniques common to the biotechnology laboratory, and to demonstrate a proficiency in the application of instrumentation to evaluate data generated in the biotechnology laboratory.

7) Develop a variety of skills in specialized areas of biotechnology that will permit students to tailor their learning outcomes to job needs and opportunities.

- The Student Learning Outcomes of the Biotechnology Certificate Program were developed, and are periodically amended and revised with the input of the local biotechnology industry through a biotechnology industry advisory group (BETA) established by Dean Dr. Ron Quinta.
- Assessment of Student Learning Outcomes must be designed to ensure that students earning Certificates in Biotechnology are prepared to succeed in entry-level jobs. Students must be assessed in:

1) knowledge and practice of laboratory safety and laboratory etiquette. Assessment will occur by faculty observation of student behavior and performance in the laboratory environment.

2) understanding the need for and maintaining the proper laboratory documentation, e.g., laboratory notebooks. Assessment will entail periodic evaluation of student-generated documents according to established documentation guidelines.

3) using the scientific method in their investigations in the biotechnology laboratory. Assessment of experimental design via faculty review of student work, as well as performance on exams will be used.

4) use of mathematical skills to prepare reagents, buffers, etc. will be assessed by faculty review of student laboratory performance, faculty review of documents supporting the preparation of laboratory materials, and by student performance on practical examinations.

5) knowledge of the theoretical foundations of biotechnology procedures and methods will be assessed through examination.

6) knowledge and expertise using laboratory instrumentation will be assessed by faculty observation of student performance in the laboratory, by review of student documentation of instrument usage, and by student performance on practical examinations.

7) knowledge and expertise gained in special topics, e.g., cell culture, protein purification, DNA sequencing, etc., will be assessed by faculty observation of student performance in the laboratory, by review of student documentation of instrument usage, and by student performance on practical examinations.

- The data required to assess and evaluate the success of the Biotechnology Certificate Program will include:

1) the number of students earning Certificates

2) the number of students obtaining internships and jobs in biotechnology

3) the number of students, and incumbent workers, enrolling in special topics

4) response surveys from local biotechnology employers of Ohlone students that assess the quality of student training in meeting industry demands

4. Assessment of Program Through Review of the Teaching Learning Process:

Data? Yvette, do we have data on student employment rates and internships?

