



Cal State San Marcos

BIOTECHNOLOGY LABORATORY TECHNICIAN CERTIFICATE

Program Overview

The Biotechnology Laboratory Technician Certificate consists of five classes (16 semester units). It is designed to train individuals with the skills necessary to secure entry-level positions in biotechnology as lab technicians or research assistants. The program curriculum provides an overview of the industry and the functions of biotechnology and pharmaceutical laboratories in research, manufacturing and quality control. The current offering of this Certificate of Competency program is designed to be a cohort model where the selected group goes through pre-determined course sequence together. The Certificate program may be completed in a little over two semesters of study including the Science Boot Camp (approximately eight months).

The Biotechnology Laboratory Technician Certificate courses:

- Cover a range of topics deemed crucial in supplying a solid science foundation, supplemented by hands-on training in a laboratory setting.
- Are taught by faculty from the Biology, Chemistry and Biotechnology departments.
- Train you to be well versed in cutting edge technologies and current market trends.
- Emphasize the process of discovery and development of new products and the bioscience industry.

Program Qualification & Prerequisites

It is generally expected that the applicant has completed two years of college courses or earned an associate degree which included some basic sciences in Biology, Chemistry and Math. Experience or proficiency in these areas will be considered for meeting the qualifications. Prerequisite courses are shown below and program courses are described on the next page to help determine your readiness for the program. (CSUSM course references are used for descriptions).

- General Chemistry (CHEM 150)
- Organic Chemistry (CHEM 201/202)
- Introduction to Cellular & Molecular Biology (BIOL 210)
- Introduction to Organismal & Population Biology (BIOL 211)

Admission Criteria

Each prospective student is required to submit an application and relevant academic records and information. Acceptance will be determined by the Biotechnology Admission Committee's assessment of these documents. If in doubt about your qualification, feel free to call for a pre-assessment.

To qualify for Admission and Sponsorship for the San Diego Workforce Partnership Program, contact one of the Career Centers listed on the back of this brochure.

Applications to the program will be reviewed on a weekly basis. Admission will be granted to program qualified participants on a rolling basis until the classes are filled.

About The Program

Days and Times of courses will vary.

Program Funded by the San Diego Workforce Partnership and the Riverside County Workforce Development Center

This program is approved for funding by the San Diego Workforce Partnership and the Riverside County Workforce Development Center to train and enable adult and dislocated workers to seek Laboratory Technician or Research Assistant roles in the Biotechnology workforce. Funding for qualified applicants include academic fees and most program associated costs.

To qualify for the sponsored program, each applicant must be reviewed and approved by the San Diego Workforce Partnership One-Stop Career Centers (see back page for complete list), or by the Riverside County Workforce Development Centers (For program eligibility, please contact one of the designated Career Centers listed on the back of this brochure.

For more information, please contact:

Jill Litschewski
Director, Science & Mathematics Programs
Extended Learning
760-750-8705
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Course Descriptions

The following credit courses are required for the certificate and must be completed with a grade point average of a "C" or better. All 16 units of the program are fully transferable academic units, and all of the units may be counted toward the CSUSM undergraduate degree in Biotechnology.

Certificate Courses

BIOT 355 Molecular Biotechnology (4 units)

In-depth treatment of the fundamental molecular techniques in use in the field of biotechnology. Designed to give hands-on experience as well as conceptual background in biotechnological methods. Subjects covered will include: nucleic acid isolations, vectors, cloning, library screening, hybridizations, PCR, sequencing, sequence analysis and bioinformatics, and transgenic organisms. Other subjects will vary to reflect current practice and developments in biotechnology. Three hours lecture and three hours laboratory.

Prerequisites: BIOL 210 and 211 or equivalent.

BIOT 356 Cellular Biotechnology (4 units)

In-depth treatment of the fundamental cellular techniques in use in the field of biotechnology. An overview of the drug discovery process is presented together with theoretical and practical aspects of specific technologies. Included in lecture/laboratory instruction are the physiology of prokaryotic and eukaryotic cells, culture of bacterial, plant, insect and mammalian cells, genetic engineering and expression systems, hybridomas, fermentation and scale-up technology, separation technology, protein purification, and immunochemistry. Three hours lecture and three hours laboratory.

Prerequisites: BIOL 210 and 211 or equivalent.

BIOT 357 Foundations of Biotechnology (2 units)

A review of biotechnology applications and product development in the life science industry. Topics will include: 1) the process of bringing a product to market from concept to sales; 2) laws, regulations, ethics, and social issues pertaining to the discovery, development, testing, manufacturing, and commercial distribution; 3) skills of technical writing, Standard Operating Procedures and documentation of regulatory, quality assurance, and intellectual property; and 4) employment opportunities.

Prerequisites: BIOL 210 and 211 or equivalent.

BIOT 358 Computer Skills for Biotechnology (3 units)

Designed to introduce and explain the application of computational and analytical methods to solve problems in biotechnology. Many of the popular software tools employed in biotechnology and informatics research will be covered. The theoretical basis governing the use and importance of these tools will also be explored.

Prerequisites: BIOL 210 and BIOL 211 or equivalent.

CHEM 341 Introduction to Biochemistry (3 units)

The object of this one semester course is to introduce students to the fundamental concepts and language of biochemistry. The areas covered are (but not limited to): basic thermodynamics of biological

systems, properties of amino acids, protein structure, introduction to enzyme kinetics, inhibition and regulation, nomenclature and structure of carbohydrates and lipids, the structure of biological membranes and membrane transport, the structure of nucleic acids and an introduction to metabolism.

Prerequisites: CHEM 150 and CHEM 201/202 or equivalent.

