SAN JOAQUIN DELTA COLLEGE

Program Narrative

Electron Microscopy - Biological Concentration Basic Sample Preparation

Certificate of Achievement

Program Goals and Objectives

Apply basic sample preparation techniques for viewing on the electron microscope.
Apply basic sample preparation histotechniques for viewing on the light microscope.
Operate the knifemaker and ultramicrotome using glass knives.
Operate various histological equipment, such as tissue processor, embedding center, microtome, and flotation bath.
Identify basic structures of cells.
Identify the various human organs by their microscopic structure.
Follow and document laboratory procedures to write scientific reports.
Apply safe laboratory practices while compounding liquids and other dilution strategies.
Operate basic equipment, such as optical light microscope and basic TEM/SEM application, needed to become an entry-level electron microscopist.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

1. Identify the basic structure of cells.
2. Apply basic sample preparation techniques for viewing on the electron microscope.
3. Operate basic equipment, such as optical light microscope and basic TEM/SEM application, needed to become an entry-level electron microscopist.
4. Document laboratory reports.
5. Apply safe laboratory practices while compounding liquids and other dilution strategies.
6. Operate a knifemaker and ultramicrotome while using glass knives.
7. Apply basic sample preparation histotechniques for viewing on the light microscope.
8. Operate various histological equipment, such as tissue processor, embedding center, microtome, and flotation bath.
9. Identify the various human organs by their microscopic structure.

Catalog Description

Upon successful completion of the Electron Microscopy - Biological Concentration Basic Sample Preparation Certificate of Achievement, the student demonstrates skills, knowledge and training for employment as a microscopist to work with research laboratories, medical schools, and hospitals. The student demonstrates the following abilities: usage of theory in hands-on work, basic specimen preparation, electron/light microscope operation, and routine maintenance of equipment. The student demonstrates skills, knowledge, and training in oral and written communication as well as a variety of skills for entry-level employment in disciplines including the following: biology, environmental areas, biotechnology, food and cosmetic industries, and medicine.

Program Requirements

Core Requirements

Units: 29.5

Complete 29.5 units

BIOL 31	Human Anatomy	4.0
CHEM 3A	Introduction to Chemistry	4.0
E M 70	Introduction to Microscopy	2.0
E M 72B	Ultramicrotomy for Electron Microscopy	4.5
E M 74	Scanning Electron Microscopy	3.0
E M 76	General Histology	3.0
E M 77	Beginning Histotechniques	5.0
E M 80	Introduction to TEM Operations	4.0

Restricted Electives

Units: 3.0

Complete 3 units

MATH 1	Calculus I	5.0
MATH 37EX	College Algebra with Support	4.0
MATH 37	College Algebra	3.0

Complete all courses with a grade of “C” or better.

Total: 32.5

Master Planning

The electron microscopy program welcomes all students and strives for an inclusive, student-centered learning environment. We aim to give our students the use of current technologies to optimize and support their professional growth and technical development. We provide extensive hands-on training on our vast line of microscopes, so that our students develop the skills needed to be successful and increase their opportunities for employment.

Need for Program

Enrollment and Completer Projections

4-6 Students, we are limiting upper level EM courses to acknowledge completion at the basic level for entry level career opportunities.

Labor Market Information (LMI)

Employment opportunities are vast and salary ranges are between $45K- $58K for entry level positions. These positions include Entry Level Biological Technicians, Precision Instrument and Equipment Repairers, and Electro-Mechanical Mechatronics Technologist and Technicians.

Place of Program in Curriculum and Similar Programs

Place of Program in Curriculum

There are no related programs as the EM program is unique as we are the only one in the nation.

Similar Programs at Other Colleges in Service Area

- None

TOP Code

0934.70 - Electron Microscopy*

CIP Code

15.0404: Instrumentation Technology/Technician.

BOT Approval

06/03/2025