BIOLOGICAL TECHNOLOGY

DIVISION: Natural Sciences

The Biological Technology Program offers five different certificate programs, each preparing you for entry-level positions in the field of biotechnology in high-tech industry and research institutions.

During the program, you will get hands-on work experience in the biotechnology industry, learn from industry speakers about current advances in biotechnology, and take tours of local biotech facilities.

- Biological Technology – Associate in Science Degree, Certificate of Achievement (https://curriculum.pasadena.edu/academic-programs/biological-technology/biological-technology-as-cert-achievement/)
- Biological Technology – Computational Biology – Certificate of Achievement (https://curriculum.pasadena.edu/academic-programs/biological-technology/biological-technology-computational-biology-cert-achievement/)
- Biological Technology – Laboratory Assistant – Certificate of Achievement (https://curriculum.pasadena.edu/academic-programs/biological-technology/biological-technology-laboratory-assistant-cert-achievement/)
- Biological Technology – Laboratory Skills – Certificate of Achievement (https://curriculum.pasadena.edu/academic-programs/biological-technology/biological-technology-laboratory-skills-occupational-skills-cert/)
- Biological Technology – Stem Cell Culture – Certificate of Achievement (https://curriculum.pasadena.edu/academic-programs/biological-technology/biological-technology-stem-cell-culture-cert-achievement/)

Courses

BIOL 102A BIOLOGICAL TECHNOLOGY - BASIC TECHNIQUES
3 unit
Prerequisite(s): *BIOL 110*

Introduction to the fundamental skills and competencies necessary for working in a biotechnology laboratory. Basic skills include use and maintenance of standard laboratory equipment, solution and reagent preparation, sterile technique, quality control protocols, basic cloning procedures, production of an industry standard notebook, and laboratory safety. Course is taught in a laboratory setting allowing students to develop workplace competencies. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Letter Grade, Pass/No-Pass*

BIOL 102B BIOLOGICAL TECHNOLOGY - ADVANCED TECHNIQUES
3 unit
Prerequisite(s): *BIOL 102A*

Advanced skills in applied biological technology with a focus on DNA and protein applications. Skills include: use and maintenance of standard laboratory equipment and scientific instruments; methods to purify, quantify, and analyze DNA and/or proteins including column chromatography, immunological assays (ELISA and Western blot analysis), PCR, and electrophoretic techniques; and the production of an industry standard laboratory notebook. DNA and protein sequence analysis performed using bioinformatics tools. Course is taught in a laboratory setting allowing students to develop workplace competencies. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

BIOL 102C BIOLOGICAL TECHNOLOGY - CELL CULTURE TECHNIQUES
3 unit
Prerequisite(s): *BIOL 102A*

Advanced skills in applied biological technology with a focus on basic mammalian cell culture techniques and specialized applications. Skills include: use and maintenance of standard cell culture laboratory equipment; aseptic techniques for cell culture; methods for the growth, propagation, and maintenance of cultured mammalian cells; cell quantitation; cell imaging; introduction of DNA into cultured mammalian cells; cell culture laboratory safety requirements; and the production of an industry standard laboratory notebook Course is taught in a cell culture laboratory setting to allow students to develop workplace competencies. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

BIOL 102D BIOLOGICAL TECHNOLOGY - LABORATORY INTERNSHIP
3 unit
Prerequisite(s): *BIOL 102B or BIOL 102C*

Enrollment Limitation: *Instructor approval*

Advanced skills in applied biological technology with a focus on practical applications in a working biotechnology laboratory. Internship in the biotechnology industry or in an academic research laboratory. Total of 180 hours unpaid or 225 hours of paid laboratory practical experience.
Grade Mode: *Letter Grade, Pass/No-Pass*

BIOL 104A APPLICATIONS OF FLUORESCENCE MICROSCOPY
2 unit
Prerequisite(s): *BIOL 102C*

Introduction to the fundamental principles of fluorescence microscopy. Exploration of specialized methods and practical biological applications of fluorescence detection and imaging using microscopy techniques currently being performed in research laboratories. Total of 18 hours lecture and 54 hours of laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

BIOL 104B MICROBIOLOGICAL APPLICATIONS USED IN BIOTECHNOLOGY
4 unit
Prerequisite(s): *BIOL 102B and BIOL 102C*

Overview of the development of the field of molecular biotechnology. Instruction on how utilization of microorganisms and their biological products led to the advent of recombinant DNA technology, molecular cloning, and genetic engineering. Demonstration of various applied molecular microbiological techniques routinely performed in biotechnology laboratories. Total of 54 hours lecture and 72 hours laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

BIOL 104C RESEARCH METHODOLOGY
3 unit
Prerequisite(s): *BIOL 102B and BIOL 038*

Capstone course integrates the use of a variety of research methodologies taught in existing biotechnology core courses to illustrate the interdisciplinary nature of scientific research. Coursework includes participation in hypothesis-driven research projects focused on the use of various gene regulatory mechanisms, including RNA interference and genome editing, to study the biology and function of mouse embryonic stem cells. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

BIOL 104D COLLABORATIVE RESEARCH EXPERIENCE
3 unit
Prerequisite(s): *BIOL 102B and 038*

Enrollment Limitation: *Permission of the instructor*

Opportunity to participate in scientific research projects in collaboration with a local research institute. Practical experience provided with basic research methodologies and strategies used in academic research, specifically in the field of stem cell biology. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Audit, Letter Grade*

BIOL 110 INTRODUCTION TO BIOTECHNOLOGY
3 unit
Research in the biotechnology industry and in academic research laboratories. Includes lectures on fundamentals of biotechnology combined with laboratory experiences to demonstrate research techniques, allowing an opportunity to explore various career pathways in the field of modern biotechnology. Total of 36 hours lecture and 72 hours laboratory.
Grade Mode: *Letter Grade, Pass/No-Pass*