

**BIOINFORMATICS**

Biology in the 21st Century is no longer purely laboratory-based, but is becoming an information-based science as well. Bioinformatics is an area of science that incorporates computational approaches to solving biological problems. Bioinformaticists must organize a phenomenal amount of biological sequence information. The information may be used to identify how genetic information is related, and the laboratory scientist designs experiments to test these connections. Laboratory scientists generate enormous amounts of data that Bioinformaticists must organize and make available to other biologists around the world. This degree and certificate are the result of collaboration between the Computers, Technology and Information Systems and Biological and Health divisions. It is a joint offering. Program information, admission criteria details and counseling information can be found at the Bioinformatics website: www.foothill.edu/bio/programs/bioinfo/.

CAREER OPPORTUNITIES

The field of Bioinformatics is rapidly evolving and growing. New methods of storing and accessing data are needed for Biologists to make efficient use of the data. Students who complete this certificate will be suitable for entry-level positions in biotech or pharmaceutical companies that use computers to analyze biological data.

UNITS REQUIRED FOR MAJOR: 47**UNITS REQUIRED FOR CERTIFICATE(S): 43****ASSOCIATE DEGREE REQUIREMENTS:**

- English proficiency: ENGL 1A, ESL 26 or equivalent.
 - Mathematics proficiency: MATH 103/105 or equivalent.
- A minimum of 90 units required to include:
- All General Education requirements
 - **BIOL 12** Human Genetics (4 units) or **BIOL 1D** Molecular Genetics (4 Units)
 - **MATH 10** Elementary Statistics (5 Units)
 - Biotechnology Core Courses (13 Units)
 - Computer Science Core Courses (25 Units)
 - Other electives & graduation requirements as appropriate.

NOTE: All courses pertaining to the major must be taken for a letter grade. In addition, a GPA of 2.0 or higher is required in all Core and Support courses for the Degree or Certificates.

Program Prerequisites (or their equivalent):

CIS 50A Using the Computer: PC (Windows) (4 Units)
COIN 51 Internet Technology & Applications: Introduction (5 Units)
MATH 220 Elementary Algebra (5 Units)
ENGL 110 Introduction to College Writing (5 Units)
or ESL 25 Composition & Reading (5 Units)

or Equivalent.

CORE COURSES:**Biotechnology Core Courses (13 units)**

- BTEC 51A Cell Biology for Biotechnology (3 Units)
- BTEC 52A Molecular Biology for Biotechnology (3 Units)
- BTEC 65 Nucleic Acids Electrophoretic Systems: Basic Laboratory Techniques (1 Unit)
- BTEC 68 Polymerase Chain Reaction: Basic Laboratory Techniques (1 Unit)
- BTEC 71 DNA Sequencing & Bioinformatics: Basic Laboratory Techniques (2 Units)
- BTEC 76 Introduction to Microarray Data Analysis (2 Units)
- BTEC 64 Protein Electrophoretic Systems: Basic Laboratory Techniques (1 Unit)
- BTEC 66 HPLC: Basic Laboratory Techniques (2 Units) (recommended, but not required)

Computer Science Core Courses (25 units)

- CIS 52A Introduction to Data Management Systems (5 Units)
- CIS 52B Oracle SQL (5 Units)
- CIS 68A Introduction to LINUX & UNIX (5 Units)
- CIS 68E Programming in PERL (5 Units)
- COIN 81 Introduction to Bioinformatics Tools & Databases (5 Units)

CERTIFICATE INFORMATION:**Certificate of Achievement (43 Units)**

- MATH 10 Elementary Statistics (5 Units)
- Biotechnology Core Courses (13 Units)
- Computer Science Core Courses (25 Units)

Academic Year 2008-2009