

CERTIFICATE IN DATA SCIENCE AND MACHINE LEARNING FOR BIOTECHNOLOGY PROFESSIONALS

The fields of Data Science and Machine Learning (ML) are being increasingly leveraged to investigate long-standing problems in biotechnology and to develop solutions to some of the most critical challenges of our times. Individuals with these interdisciplinary skillsets are in high demand. Through this certificate, individuals can reskill themselves to obtain specialized training in these high-demand fields and find a path to meaningful and well-paying careers.

The certificate program is designed to provide a strong foundation in theory, tools, and techniques of machine learning and data science for biotechnology. Students will learn and practice the skills involved in synthesizing machine learning and data science concepts around the big questions in biotechnology to solve real-life problems. Students will also gain experience in effective scientific communication skills that are needed to convey information to multidisciplinary audiences from different functional areas of the biotechnology field.

This certificate is designed for individuals with no prior background in computing or data science. The curriculum is developed in close collaboration with biotechnology industry practitioners to align it well with the technical needs of the biotech/pharmaceutical industries. The program is also designed to accommodate professionals in various work-life situations so as to broaden the participation of individuals from diverse socioeconomic backgrounds in this fast-growing field.

Admissions Requirements

To be eligible for admission a student must:

1. Have a high school diploma or equivalent.
2. Be a resident of California or another authorized state. See **State Authorization**.

Students will apply using a Qualtrics form and will be accepted on a first-come, first-served basis. No supplemental materials will be required.

Program Learning Outcomes

1. Demonstrate proficiency in the fundamentals of computer programming, data science and machine learning for biotechnology: theory, tools, and techniques.
2. Demonstrate ability to synthesize computer programming, machine learning and data science concepts around the big questions in biotechnology to develop solutions to real-life problems.
3. Demonstrate effective scientific communication skills, verbal and written, to convey information to multidisciplinary audiences from different functional areas of the biotechnology field.

Certificate in Data Science and Machine Learning for Biotechnology Professionals - 15 units

Required Courses (12 units)

Course substitutions may be approved with the faculty director's written approval.

Code	Title	Units
CSC 306	An Interdisciplinary Approach to Computer Programming	3
CSC 311	Data Structures for Data Science Application Development	3
CSC 408	Machine Learning and Data Science for Personalized Medicine	3
CSC 411	Intermediate Machine Learning for Interdisciplinary Data Scientists	3

Electives (3 units)

Select One:

Code	Title	Units
CSC 509	Data Science and Machine Learning for Medical Image Analysis	3
CSC 699	Independent Study	1-3