ONLINE GRADUATE CERTIFICATE IN

Applied Bioinformatics

Bridging life sciences and computational sciences

bioinformatics.udel.edu/ABNF-CERT/
The completion of the human genome sequence early in the 21st century marked the beginning of a new era of biological research. Since that time, life sciences research has produced an explosion of big data, with biology becoming an increasingly quantitative science. Computational approaches, in combination with experimental methods, have become essential for generating hypotheses, deriving new scientific knowledge and driving discovery and innovation.

As big data is pouring out of life sciences research, it is creating ample opportunities for scientists with expertise in bioinformatics, computer science, and related skill sets. In fact, the bioinformatics market is expected to grow to $12.86 billion by 2020.

**Advance Your Career**

Life sciences, computer or mathematics professionals with expertise in bioinformatics will join the next generation of researchers and professionals to play a key role in multi- and interdisciplinary teams, bridging life sciences and computational sciences.

Job opportunities exist in rapidly growing fields like:

- genomic medicine
- pharmaceuticals
- healthcare
- agriculture
- big data analytics

Helping to meet the increased demand for professionals who have the ability to interpret complex biological data, UD’s Online Graduate Certificate in Applied Bioinformatics program enables students to build their knowledge of bioinformatics methods, tools and databases.
The four-course **Online Graduate Certificate in Applied Bioinformatics** is designed for working professionals who wish to gain knowledge and practical experience in bioinformatics.

**Why University of Delaware**

Students will gain core competency in bioinformatics for real-world applications and will experience high-impact experiential learning, coupling lecture-based instruction with hands-on exercises, team-based term projects and individual e-learning.

Course instructors are nationally and internationally recognized researchers and practitioners in the fields of bioinformatics, computational biology, systems biology, genomics, translational bioinformatics, and big data.

**Who Should Apply**

The program targets professionals working in:

- molecular and cellular biology
- genetics
- biomedical engineering
- medical science
- scientific programming
- software development

Applicants must be in the last semester of undergraduate study or hold an undergraduate degree in biological, computational, or other disciplines from an accredited four-year college or university, and are expected to have competence in mathematics, computer science and/or biology.

No programming or database experience is required, but a familiarity with molecular biology concepts is recommended.

**Key Learning Outcomes**

The program is offered in a 100%-online format. Participants will:

- Master basic concepts of bioinformatics, including data retrieval and nucleic acid and protein sequence analysis
- Gain an understanding of web accessible bioinformatics applications, including how data is processed and how to interpret results
- Perform analyses of various biological data types by adapting existing bioinformatics tools, designing new ones or a combination of both
- Earn graduate credit, which may be applicable toward a master’s or Ph.D. degree program
Online Graduate Certificate in Applied Bioinformatics

Curriculum
The four-course curriculum can be completed in any order. Each 3-credit online course is offered annually during either fall or spring semester, with two courses offered each semester, so that the graduate certificate program can be completed in as little as one year.

Databases for Bioinformatics (BINF 640)
Principles and techniques of the bioinformatics database development cycle from data modeling to relational database management and web hosting.

Bioinformatics (BINF 644)
Principles of molecular sequence analysis and genome annotation with practical guides to bioinformatics resources, databases and tools.

Programming for Bioinformatics (BINF 690)
Principles and techniques of computer programming using Python language framed within the context of bioinformatics.

Systems Biology (BINF 694)
Bioinformatics interpretation and biological network analysis of omics data from next-generation sequencing (genomics, transcriptomics) and other high-throughput technologies.

FOR MORE INFORMATION
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