

Certificate in Bioinformatics

About

Bioinformatics is a rapidly growing field that brings together elements of biology chemistry, computer science, physics, and statistics. Bioinformatics is an area of rapid job growth and has become an essential part of healthcare research and the biotechnology and pharmaceutical industries.

Bioinformatics specialists are employed to process and analyze the high volume of genomic and proteomic data generated from large scale sequencing and related efforts that form the foundation of personalized medicine.

The Certificate in Bioinformatics program will credential such students in the field through a curriculum chosen according to the student's interest or gap in knowledge.

Students can complete the certificate in 1 - 2 semesters, or, for the part time student, the time required to complete 12 credits of core classes. The classes will be taught by the same faculty as in the PSM in Bioinformatics program, as students will be taking the same core classes as the PSM in Bioinformatics students without committing to a capstone project or a graduate degree requiring 30 credits. Students will have to maintain a GPA of 3.0 to receive a Certificate in Bioinformatics.

Time Limit for Certificate Completion: 2 Years

Campus Location: Main Campus

Full-Time/Part-Time Status: May be completed on full time or part time basis.

Non-Matriculated Student Policy: Non-matriculated students may take up to 9 credits of coursework before applying to the graduate certificate program.

ADMISSION

Application Deadline:

Applications are processed on a continual basis. Ordinarily, the applicant is informed of an admissions decision within four to six weeks of receipt of all supporting application documents. Late applications may be considered for admission.

International Students: The certificate does not fulfill the F-1 visa requirement of full time course work for international students. International students already in PSM or other graduate programs at Temple may enroll in the certificate program, in addition to their current program, with approval from their program's graduate advisor.

Letters of Reference:

Number Required: 2

From Whom: Letters should be obtained from college/university faculty or faculty who are familiar with the applicant's competency. If the applicant has an established career in a related field, the applicant's immediate supervisor should provide one of the letters.

Coursework Required for Admission Consideration: Applicants should have a strong background in one or more STEM fields: Science, Technology, Engineering, and Mathematics.

Bachelor's Degree in Discipline/Related Discipline: The Bioinformatics Certificate has been designed for recent graduates and professionals who have a bachelor's degree or equivalent in a STEM field.

Statement of Goals: In approximately 500 to 1,000 words, specify your interest in the Bioinformatics Certificate, your career goals, and your academic and professional achievements.

Standardized Test Scores:

GRE: Required. A combined minimum score of 305 on the quantitative and verbal reasoning sections of the new test is expected.

Interview: An in-person or Skype interview is required.

Transfer Credit: Graduate credits from an accredited institution may be transferred into the Bioinnovation P.S.M. program. The credits must be equivalent to coursework offered by the Biology Department at Temple University. A grade of "B" or better must have been earned for the credits to transfer. The Bioinnovation Steering Committee makes recommendations to the Department Chair for transferring credit on an individual basis. The maximum number of credits a student may transfer is 6.

Program Requirements:

Required to take any 4 of the core classes.

Core classes and elective classes can be found here:

<http://bulletin.temple.edu/graduate/scd/cst/bioinformatics-psm/#programrequirementstext>

or

Student must take a total of 12 credits of classes from this list

[BIOL 5403](#) Genomics | 3 credits

[BIOL 5411](#) Structural Bioinformatics I 3 credits

[BIOL 5514](#) Biological Models in Python | 3 credits

(students can substitute CIS 5015 Scripting for Sciences and Business| 3 credits)

[CHEM 5412](#) Structural Bioinformatics I 3 credits

[BIOL 5509](#) Computational Genomics | 3 credits

[BIOL 5312](#) Biostatistics | 3 credits

Contact:

Program Web Address:

<http://bioinformatics.cst.temple.edu/>

Department Information:

Dept. of Biology
255 Biology-Life Sciences Building
1900 N. 12th Street
Philadelphia, PA 19122-6078
hey@temple.edu
215-204-8854

Submission Address for Application Materials:

<https://apply.temple.edu/CST/>

Department Contacts:

Program Co-Directors:

Jody Hey, Ph.D.

hey@temple.edu

Ronald Levy, Ph.D.

ronlevy@temple.edu

P.S.M. Program Coordinator:

Seema Freer, Ph.D.

sfreer@temple.edu

Courses:

BIOL 5132 Biostatistics 3 credits

Biostatistics is an important part of the research activities related to biological and medical issues. Statistics is used to analyze phenomena with random properties and is often essential to draw the right conclusions based on a data set. The course will be designed to cover different statistical methods for data analysis mainly applied to medical and biological problems. Advanced undergraduate and graduate students with interests in medicine and biomedical research will benefit most from the course. However statistical methods that can be applied to behavioral science and ecology will also be covered.

BIOL 5403 Genomics 3 credits

This graduate course will cover the processes of gene inheritance and gene expression as they are manifested across the entire genome. Students will learn about genome-related technologies, including genome sequencing and mapping. They will also learn about genome structure and how genomes vary across species, as well as the forces driving these evolutionary changes. A significant part of the course will cover genome-level data analyses, and students will complete a major project in genome analysis, in addition to several smaller problem-based assignments

BIOL 5411 Structural Bioinformatics I 3 credits

This graduate course will cover the processes of gene inheritance and gene expression as they are manifested across the entire genome. Students will learn about genome-related technologies, including genome sequencing and mapping. They will also learn about genome structure and how genomes vary across species, as well as the forces driving these evolutionary changes. A significant part of the course will cover genome-level data analyses, and students will complete a major project in genome analysis, in addition to several smaller problem-based assignments

CHEM 5412 Structural Informatics II 3 credits

This course is designed to provide a basic introduction to experimental and computational methods used in protein structure determination and molecular modeling. The course emphasis will be on the use of computational methods to understand protein folding, dynamics and structure based drug design. The course will provide practical training in the application of modeling techniques in drug discovery.

BIOL 5509 Computational Biology 3 credits

This is a course on the application of genome-related concepts to genome sequence data. Students will gain familiarity with both existing software and with basic programming (scripting) skills for problems in genomics. Further, students will come to understand the connections between standard computational and statistical approaches and their underpinnings in those fields increasingly dominated by genomic approaches, These include the fields of molecular evolution, population

genetics, molecular genetics, molecular biology, and biochemistry. The course will be a hands-on computational lab course, with students working on problems and assignments in class using their laptop computers. Shell scripting and the programming language Python will be used for most of the course.