Bioinformatics, P.S.M.

COLLEGE OF SCIENCE AND TECHNOLOGY

Learn more about the Professional Science Master's in Bioinformatics.

About the Program

Bioinformatics is the science that happens when computers are joined with the latest discoveries in genomics, biochemistry, and biophysics. It is a rapidly growing field that brings together elements of biology, chemistry, computer science, physics, and statistics. The Bioinformatics degree at Temple University, a leader in the field, is a two-year Professional Science Master's (P.S.M.) degree that features:

- an interdisciplinary approach involving scientists from across Temple University;
- classes taught by esteemed tenure and tenure-track faculty as well as by our industry and government partners;
- hands-on training in professional and management skills;
- partnerships with industry and government leaders, including a diverse and active External Advisory Board;
- access to real-world independent research projects; and
- an applied focus on responsibility and ethics in research and policy.

Time Limit for Degree Completion: 2 years

Campus Location: Main

Full-Time/Part-Time Status: The degree program can be completed on a full- or part-time basis. Most of the classes are offered in the evenings or on weekends to enable full-time working professionals to be enrolled in the program. International students are required to register as full-time students.

Interdisciplinary Study: Students in the Temple University Bioinformatics master's degree program benefit from an advanced curriculum developed by leading Temple faculty in the Departments of Biology, Chemistry, and Computer and Information Sciences. The program has been designed to provide students with extensive skills in computer programming as well as deep knowledge in genomics and structural biology. All three areas are required in this challenging and exciting field. Because the degree is a Professional Science Master's, the program also offers:

- professional skills through courses in professional development;
- a research internship in a biotech company or other research center; and
- connections to key employers in the Philadelphia area.

Accreditation: Temple University is fully accredited by the Middle States Commission on Higher Education.

Areas of Specialization: The degree program designed by some of the top scientists in the areas of genomics, evolutionary medicine, and structural bioinformatics allows students to specialize in Computational Bioinformatics, Genetics/Genomics, or Structural Bioinformatics as part of the capstone research and choice of electives. Students are trained to analyze genomic and proteomic data generated from large-scale sequencing and related efforts that form the foundation of personalized medicine.

Job Prospects: Official job placement is not offered, but Bioinformatics is an area of rapid job growth and has become an essential part of healthcare research and the biotechnology and pharmaceutical industries. Graduates of P.S.M. programs are in high demand, underscoring the P.S.M. as an attractive career path for those who do not wish to become academic researchers or pursue a doctorate.

Non-Matriculated Student Policy: Non-matriculated students may enroll in a total of three courses (9 credits) with permission of the instructor and the Biology Department.

Financing Opportunities: Financial assistance in the form of Research or Teaching Assistantships is not offered at this time.

Admission Requirements and Deadlines

Application Deadline:

Fall: March 1; December 15 international
Spring: November 1

Note that Spring admission is rare as coursework is designed to start in the Fall. Late applications may be considered for admission.

APPLY ONLINE to this graduate program.

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 P.S.M. program 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 P.S.M. program, career goals, and academic and professional achievements.

Standardized Test Scores:
GRE: Required. A combined minimum score of 305 on the quantitative and verbal reasoning sections is expected.

Applicants who earned their baccalaureate degree from an institution where the language of instruction was other than English, with the exception of those who subsequently earned a master's degree at a U.S. institution, must report scores for a standardized test of English that meet these minimums:

• TOEFL iBT: 90
• IELTS Academic: 6.5
• Duolingo: 110
• PTE Academic: 61

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

Transfer Credit: Graduate credits from an accredited institution may be transferred into the Bioinformatics 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 P.S.M. in Bioinformatics 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

General Program Requirements:
Number of Credits Required Beyond the Baccalaureate: 30

Required Courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 5312</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 5403</td>
<td>Genomics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 5411</td>
<td>Structural Bioinformatics I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 5506</td>
<td>Professional Development Seminar for PSM in Biotechnology</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 5509</td>
<td>Computational Genomics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 5511</td>
<td>Ethics in Bioinformatics</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 5514</td>
<td>Biological Models in Python</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 5412</td>
<td>Structural Bioinformatics II</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives
Select two courses from within one of the foundational areas below: 6

Computational Bioinformatics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 5015</td>
<td>Scripting for Sciences and Business</td>
</tr>
<tr>
<td>CIS 5105</td>
<td>IT Process Management</td>
</tr>
<tr>
<td>CIS 5106</td>
<td>System Development Processes</td>
</tr>
<tr>
<td>CIS 5107</td>
<td>Comp Systems Security&amp;Privacy</td>
</tr>
<tr>
<td>CIS 5108</td>
<td>Emerging Technologies</td>
</tr>
<tr>
<td>CIS 9669</td>
<td>Distributed and Parallel Computer Systems</td>
</tr>
</tbody>
</table>

Genetics/Genomics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 3101</td>
<td>Evolution</td>
</tr>
<tr>
<td>BIOL 3211</td>
<td>Human Evolution</td>
</tr>
</tbody>
</table>
BIOL 5225  Evolutionary Genetics Genomics
BIOL 5479  Biotechnology
BIOL 5505  Ethics Regulation and Policy in Biotechnology

Structural Bioinformatics
CHEM 3405  Physical Chemistry of Biomolecules
CHEM 5301  Quantum Chemistry
CHEM 5302  Statistical Thermodynamics
CHEM 8302  Computational Chemistry
PS 8128  Principles in Drug Discovery

Capstone Course
BIOL 9995  Capstone Project 1 3

Total Credit Hours 30

1  BIOL 9995 is taken for a total of three credits over two terms, as shown in the Plan of Study Grid below.

Plan of Study Grid

Year 1
Fall
BIOL 5403  Genomics 3
BIOL 5411  Structural Bioinformatics I 3
BIOL 5514  Biological Models in Python 3

Term Credit Hours 9

Spring
BIOL 5509  Computational Genomics 3
CHEM 5412  Structural Bioinformatics II 3
Elective 3

Term Credit Hours 9

Year 2
Fall
BIOL 5312  Biostatistics 3
BIOL 5506  Professional Development Seminar for PSM in Biotechnology 1
BIOL 5511  Ethics in Bioinformatics 2
BIOL 9995  Capstone Project 1

Term Credit Hours 7

Spring
BIOL 9995  Capstone Project 2
Elective 3

Term Credit Hours 5

Total Credit Hours 30

Culminating Events:

Capstone Project:
BIOL 9995 Capstone Project constitutes a culminating event of the Bioinformatics P.S.M. and requires the submission of a written project and oral presentation of the results. Capstone research may be completed in any laboratory at Temple University at the invitation of the Principal Investigator (PI) or through an internship/co-op/full-time job in the field of Bioinformatics in industry, the healthcare system, or a government agency. Since all P.S.M. in Bioinformatics classes are offered in the evening, students can avail themselves of these opportunities during the day. The process of locating internships is facilitated by the P.S.M. in Bioinformatics program based on the specific research and career interests of the individual student.

Contacts

Program Web Address:
https://www.temple.edu/academics/degree-programs/bioinformatics-psm-st-binf-psm
Department Information:
Dept. of Biology
255 Biology-Life Sciences Building
1900 N. 12th Street
Philadelphia, PA 19122-6078
cst.psm@temple.edu
215-204-8854

Submission Address for Application Materials:
https://cst.temple.edu/academics/graduate-programs/apply-now

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