Informatics Programs

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www.informatics.ischool.illinois.edu
Bioinformatics is a subdiscipline of biology and computer science concerned with the acquisition, storage, analysis, and dissemination of biological data.
MS in Bioinformatics at UIUC

• Cross-campus program though you apply to one of the 4 participating units (iSchool, ANSC, CPSC or CS)

• Campus-wide Core Curriculum: Biology, Fundamental Bioinformatics, Computer Science & Informatics

• Each unit has their own specific requirements for the degree
### Core Curriculum - Biology:

<table>
<thead>
<tr>
<th>Biology (choose one)</th>
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</thead>
<tbody>
<tr>
<td><strong>ANSC 441</strong></td>
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<tr>
<td><strong>ANSC 444</strong></td>
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<tr>
<td><strong>ANSC 446</strong></td>
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<tr>
<td><strong>BIOP 401</strong></td>
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<tr>
<td><strong>BIOP 550</strong></td>
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<tr>
<td><strong>CPSC 452</strong></td>
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<tr>
<td><strong>CPSC 466</strong></td>
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<tr>
<td><strong>CPSC 563</strong></td>
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<tr>
<td><strong>CPSC 566</strong></td>
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<tr>
<td><strong>MCB 400</strong></td>
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<td><strong>MCB 450</strong></td>
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<td><strong>MCB 501</strong></td>
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<td><strong>MCB 502</strong></td>
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Core Curriculum - Fundamental Bioinformatics:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>ANSC 542</td>
<td>Applied Bioinformatics</td>
</tr>
<tr>
<td>ANSC 545</td>
<td>Statistical Genomics</td>
</tr>
<tr>
<td>CHBE 571</td>
<td>Bioinformatics</td>
</tr>
<tr>
<td>CPSC 567</td>
<td>Bioinformatics &amp; Systems Biol</td>
</tr>
<tr>
<td>CS 466</td>
<td>Introduction to Bioinformatics</td>
</tr>
<tr>
<td>IB 467</td>
<td>Principles of Systematics</td>
</tr>
<tr>
<td>MCB 432</td>
<td>Computing in Molecular Biology</td>
</tr>
</tbody>
</table>
## Core Curriculum - Computer Science & Informatics:

<table>
<thead>
<tr>
<th>Computer Science and Informatics (choose one)</th>
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<tbody>
<tr>
<td><strong>CS 411</strong></td>
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<tr>
<td><strong>CS 466</strong></td>
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<tr>
<td><strong>CS 473</strong></td>
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<tr>
<td><strong>CPSC 565</strong></td>
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<tr>
<td><strong>IS 455</strong></td>
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<tr>
<td><strong>IS 507</strong></td>
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<tr>
<td><strong>STAT 428</strong></td>
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<tr>
<td><strong>STAT 440</strong></td>
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<td><strong>STAT 448</strong></td>
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<tr>
<td><strong>STAT 480</strong></td>
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<tr>
<td><strong>STAT 525</strong></td>
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</tbody>
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MS in Bioinformatics

Manage information in biomedical settings
MS in Bioinformatics

- Prepares students for a career in managing and analyzing information to promote positive health outcomes.
- Degree offers an interdisciplinary education, while learning how to use technology to evaluate biomedical information.

Careers Include

- Biomedical Semantics Engineer
- Data Curator
- Medical Data Scientist
- Bioinformatics Analyst
Areas of Focus Include:

- Using data to develop health indicators and improve patient outcome
- Automatically extracting claims from biomedical literature
- Facilitating new knowledge about drug interactions
- Enhancing precision in reviewing medical literature
- Combating misinformation
Coursework:

• 1 course from each of the campus-wide core areas
• 1 course from each of the following groups:
  – Data Stewardship
  – Data Analytics
  – System Policy & Design
• 12 credits of electives (could include 8 credits of thesis)
100% of Survey Respondents Secured Destination

- Employed: 86%
- Enrolled in Additional Education: 14%
Application Requirements

- Transcripts
- Resume
- Personal Statement
- 3 Letters of Recommendation
- GRE Test if GPA is below 3.0 only*
- English Proficiency Test*

Pre-requisite Knowledge,
- CS 225 (Data Structures) and Introductory Programming (IS 452)
- Math 225 (Matrix Theory) and Introductory Statistics (STAT 100 or PSYC 235)
Application Deadline | Fall 2022

Final Application Deadline: January 15, 2022
Decision Notification Date: March 16, 2022
Deadline to Accept: April 15

Visit us @
https://ischool.illinois.edu/degrees-programs/ms-bioinformatics/apply

Contact us @
is-futurestudents@Illinois.edu
Master of Bioinformatics, Animal Sciences concentration

Questions: ansci-gradprog@illinois.edu
Outline

• Resources
• Application
• Degree requirements
• Areas of study
• Post-graduation carrer pathways
Resources:
https://ansc.illinois.edu/academics/graduate-degrees
Application materials

- Transcripts
- Resume (any length)
- Personal statement (any length)
- 3 letters of recommendation
- GRE score
  - No minimum
  - admissions without GRE scores are granted but students must submit GRE scores by end of first semester in program
- English Proficiency score (if applicable)
- ≥ 3.0 GPA in last 60 credit hours of transcripts
  - Slightly lower GPAs acceptable
Application materials (cont’d)

- This is a “with thesis” degree
- Applicants are encouraged to identify a thesis faculty advisor before starting the degree
- Applicants are recommended to communicate with potential advisors before and during admission
- The faculty advisor will communicate to the Graduate Program Office her/his/their intent to mentor the student
- Admissions in Fall, Spring, and Summer
Degree requirements

- Master of Science in Bioinformatics, Animal Sciences option (≥ 36 hrs): 5 years max. (on average 2 years)
  - ≥ 26 credit hrs of lecture or lab course work
  - ≥ 2 hrs 500-level course
  - Course work must include:
    - ≥ 4hrs in biology core course(s)
    - ≥ 4hrs in computer sciences core course(s)
    - ≥ 4hrs in bioinformatics core course(s)
    - List of core courses available at https://www.informatics.illinois.edu/bioinformatics-masters/
  - ≥ 2 credit hrs of ANSC 590 or ANSC 591 (Bioinformatics) seminar
    - registration every Fall and Spring semester for discipline seminar
  - ≥ 8 credit hrs of ANSC 599 thesis research
    - Pass thesis defense and deposit thesis
  - if applicable, English proficiency (ESL) courses required
  - ≥ 3.0 GPA
Areas of study

• Bioinformatics research in
  ▪ Molecule:
    ▪ DNA, genes, RNA, proteins, metabolites, peptides, microbiome
  ▪ Disciplines:
    ▪ Immunology, nutrition, reproduction, physiology, microbiology, muscle biology, behavior, etc.
  ▪ Animals:
    ▪ Mice, dogs, cat, pigs, cattle, foxes, elephants, rhinoceroses, etc.
  ▪ Cells, tissues, organs
Post-graduation Career Pathways

Bioinformatics Analyst

Baylor College of Medicine
Houston, TX 77030

You must create an Indeed account before continuing to the company website to apply.

Bioinformatics Programmer

NVU Langone Health
New York, NY 10016

Full-time

You must create an Indeed account before continuing to the company website to apply.

Bioinformatics Analyst

EMD Serono
Remote + Remote
$50 - $65.00 an hour - Full-time, Temporary, Contract

Bioinformatics Analyst

Sera Prognostics
Salt Lake City, UT 84109
Temporarily remote
$110,000 - $135,000 a year - Full-time

Employer activity reviewed job 2 days ago

Post-graduation Career Pathways

Bioinformatics Analyst

Experience with version control systems like GIT

Familiarity with Linux command line and with Amazon S3

Familiarity with basic statistics and machine learning concepts

Understanding of basics in molecular biology, oncology and/or immunology

Experience with biological ontologies and structured vocabularies

Ability to translate biological questions to actionable analysis

The position will expose the candidate on how to answer translational questions in drug development using analysis of big data and allow opportunities to learn other aspects. The candidate will also have the opportunity to work in matrix teams and communicate results to our customers in an international setting in one of the best places to work!

EMD Serono is an Equal Employment Opportunity employer. No employee or applicant for employment will be discriminated against on the basis of race, color, religion, age, sex, sexual orientation, national origin, ancestry, disability, military or veteran status, genetic information, gender identity, transgender status, marital status, or any other classification protected by applicable federal, state, or local law. This policy of Equal Employment Opportunity applies to all policies and programs relating to recruitment and hiring, promotion, compensation, benefits, discipline, termination, and all other terms and conditions of employment. Any applicant or employee who believes they have been discriminated against by the Company or anyone acting on behalf of the Company must report any concerns to Human Resources Business Partner, Legal, or Compliance immediately. The Company will not retaliate against any individual because he/she made a good faith report of discrimination.

Job Type: Full-time, Contract, Temporary

Pay: $30.00 - $45.00 per hour

Schedule:
8 hour shift

Education:
Master’s (Required)

Work Location:
Fully Remote

Animal Sciences
COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES
MS in Bioinformatics in Computer Science

Questions? Check the FAQ’s at https://cs.illinois.edu/admissions/graduate/faqs

email: academic@cs.Illinois.edu
CS Dept. Focus:

Bioinformatics applications of data mining and information systems, artificial intelligence, scientific computing, formal systems, parallel programming and theoretical computing. Research includes developing efficient and scalable algorithms for biomolecular simulation and applying data mining, statistical machine learning, natural language processing and information retrieval to analyze and mine all kinds of biological data, including DNA sequences, protein sequences and structures, microarray data and biology literature.
Required Coursework:

CS 411 and CS 473
STAT 410
1 Biology core course
1 Bioinformatics core course
16 credits of electives (12 from CS)
Other Things to note:

- Not a thesis degree
- Minimum of 12 credits of 5xx level courses
- Minimum 3.0 GPA
- Maximum of 5 consecutive semesters (fall & spring) to complete degree
Application Materials:

- Online application
- 3 letters of reference
- Transcripts
- Statement of purpose
- CV/ Resume
Deadlines:

Fall admission:
Applications due January 15\textsuperscript{th}; decisions made March 15\textsuperscript{th}

Spring admission:
Applications due October 15\textsuperscript{th}; decisions made November 15\textsuperscript{th}
Careers:

- Computational Biology
- Data Science
- Applications of AI and ML in Biomedical fields
- PhD programs
MS in Bioinformatics in Crop Science
Both Thesis and non-Thesis Options

Application Deadlines:
December 1 for Summer or Fall Admission
September 15 for Spring Admission

Either option takes approx. 2.5 years

For more information see the CPSC Grad Handbook
https://cpsc.illinois.edu/future-students/admissions/graduate-admissions
CPSC Dept. focus: Bioinformatics to enhance agriculture, food and environment, within a human-community dimension. The program is multidisciplinary and addresses important issues in biology, biotechnology and translational research, focusing on the management and exploitation of the microbial, plant and animal genomic resources of the world. It provides advanced training in biomolecular, statistic and information systems important for those seeking job opportunities in the biotechnological, pharmaceutical, agrochemical and agrobiological sectors, in either academia, government or industry.
Thesis Option

32 credits total

- 1 course from each of the campus-wide core areas
- 16 credits of electives (min of 12 cr at 5xx level, min of 8 cr in CPSC, min of 7 credits in Comp/Quat/Stat Biology including either CPSC 440 or 540, CPSC 598 seminar every semester)
- 4 credits of thesis
- Thesis plus final oral exam
Non-Thesis Option

36 credits total

• 1 course from each of the campus-wide core areas
• 24 credits of electives (min of 12 cr at 5xx level, min of 8 cr in CPSC, min of 7 credits in Comp/Quat/Stat Biology including either CPSC 440 or 540)
• Final oral exam
Application Materials:

• Online application
• 3 letters of reference
• Transcripts
• Statement of purpose
• CV/ Resume
• GRE is recommended!
## Summary

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<thead>
<tr>
<th></th>
<th>iSchool</th>
<th>ANSC</th>
<th>CS</th>
<th>CPSC</th>
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<tbody>
<tr>
<td><strong>Credit Hours</strong></td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>Thesis = 32 Non-thesis= 36</td>
</tr>
<tr>
<td><strong>Average Program length</strong></td>
<td>2 years</td>
<td>2 years</td>
<td>Max of 5 semesters</td>
<td>2.5 years</td>
</tr>
<tr>
<td><strong>Admission Terms</strong></td>
<td>Fall &amp; Spring</td>
<td>Fall, Spring &amp; Summer</td>
<td>Fall &amp; Spring</td>
<td>Fall, Spring &amp; Summer</td>
</tr>
<tr>
<td><strong>GRE Required</strong></td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td><strong>CS 225/ Math 225</strong></td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>no</td>
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