BIOINFORMATICS: CROP SCIENCES, MS

for the Master of Science in Bioinformatics, Crop Sciences Concentration

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advisor: Nathan Schroeder
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email: sptomlin@illinois.edu
overview of grad college admissions & requirements: https://grad.illinois.edu/admissions/apply
college website: https://aces.illinois.edu/
department office: AW-101 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801
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Graduate Degree Programs in Crop Sciences

Crop Sciences, MS (http://catalog.illinois.edu/graduate/aces/crop-sciences-ms/) (on campus & online)
Bioinformatics: Crop Sciences, MS (p. 1)
Plant Biotechnology, MS - Professional Science Master's (http://catalog.illinois.edu/graduate/aces/plant-biotechnology-ms-professional-science-masters/)
Crop Sciences, PhD (http://catalog.illinois.edu/graduate/aces/crop-sciences-phd/)

The genomic and proteomic projects are generating large amounts of complex biological data that require effective storage, retrieval, analysis and interpretation. The bioinformatics degree program provides students with the skills necessary to augment the understanding and use of agricultural, biological and medical information and resources through the application of molecular, chemical, physical, computational, statistical, mathematical and informatic techniques. Students interested in this program may come with undergraduate training in one of the following areas:

1. biological and agricultural sciences,
2. statistical, mathematical and computer sciences,
3. informatics and engineering sciences.

Graduates from the bioinformatics program will be able to integrate basic and applied concepts in the three areas and apply them to bioinformatics and medical research. For additional information, please see our website at https://cropsciences.illinois.edu/graduate/.

Admission

Applicants are considered for admission to the Master of Science program if they have a bachelor’s or equivalent degree comparable to that granted by the University of Illinois. Strong letters of reference, evident motivation to undertake graduate study, and good preparation in basic science courses enhance an applicant’s credentials. For some programs, greater emphasis is given to previous training in plant sciences, chemistry, or mathematics. A grade point average equivalent to at least a B in the last 60 semester hours of undergraduate course work plus any graduate level work completed is required. All applicants whose native language is not English are required to submit the results of the TOEFL or IELTS as evidence of English proficiency. Official scores are required to be submitted directly from TOEFL/ETS or IELTS to the University.

Additional information for international applicants can be found at: https://grad.illinois.edu/admissions/apply/begin/international. Please see our web page for additional information: https://cropsciences.illinois.edu/graduate/admissions/.

Graduate Teaching Experience

Experience in teaching is considered an important part of the graduate experience in this program.

Faculty Research Interests

Please refer to the following webpage for a detailed listing of our faculty and their areas of interest https://cropsciences.illinois.edu/people/faculty/.

Financial Aid

Fellowships and assistantships are available to outstanding students on a competitive basis. Awards for financial assistance are based principally on a candidate’s academic record, statement of plans, and letters of reference.

for the Master of Science in Bioinformatics, Crop Sciences Concentration

The Crop Sciences concentration within the M.S. degree in Bioinformatics can be earned with a thesis option or a non-thesis option, which requires optional supervised research experiences.

For additional details and requirements refer to the department's graduate handbook (http://cropsci.illinois.edu/sites/cropsci.illinois.edu/files/pdf/Grad_Student_Handbook_2013.pdf) and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook/).

Thesis Option

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>ANSC 441</td>
<td>Human Genetics</td>
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<td>ANSC 444</td>
<td>Applied Animal Genetics</td>
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<tr>
<td>ANSC 446</td>
<td>Population Genetics</td>
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<tr>
<td>BIOP 401</td>
<td>Introduction to Biophysics</td>
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<tr>
<td>BIOP 550</td>
<td>Biomolecular Physics</td>
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<tr>
<td>CPSC 452</td>
<td>Advanced Plant Genetics</td>
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<td>CPSC 466</td>
<td>Genomics for Plant Improvement</td>
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<td>CPSC 554</td>
<td>Quantitative Genetics and Genomics</td>
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<td>CPSC 563</td>
<td>Chromosomes</td>
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<tr>
<td>CPSC 566</td>
<td>Plant Gene Regulation</td>
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<td>MCB 400</td>
<td>Cancer Cell Biology</td>
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<td>MCB 450</td>
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<td>MCB 502</td>
<td>Advanced Molecular and Cell Biology</td>
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<tr>
<td>Fundamental Bioinformatics (choose one)</td>
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<td>ANSC 542</td>
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<td>ANSC 545</td>
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<td>CHBE 571</td>
<td>Bioinformatics</td>
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<tr>
<td>CPSC 567</td>
<td>Bioinformatics &amp; Systems Biol</td>
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<tr>
<td>CS 466</td>
<td>Introduction to Bioinformatics</td>
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<tr>
<td>IB 467</td>
<td>Principles of Systematics</td>
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Information listed in this catalog is current as of 06/2021
### MCB 432 Computing in Molecular Biology

Computer Science and Informatics (choose one):

- CS 411 Database Systems
- CS 466 Introduction to Bioinformatics
- CS 473 Algorithms
- CPSC 565 Perl & UNIX for Bioinformatics
- IS 455 Database Design and Prototyping
- IS 507 Data, Statistical Models and Information
- STAT 428 Statistical Computing
- STAT 440 Statistical Data Management
- STAT 448 Advanced Data Analysis
- STAT 480 Data Science Foundations
- STAT 525 Computational Statistics

Seminar (1 per semester): 4

Electives: 16

Total Hours: 32

### Other Requirements

Code | Title | Hours
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Other requirements and conditions may overlap

A concentration is required

Minimum Hours Required Within the Unit: 5

Minimum 500-level Hours Required overall: 12

Minimum GPA: 3.0

### Non-Thesis Option

Code | Title | Hours
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Biology (choose one):

- ANSC 441 Human Genetics
- ANSC 444 Applied Animal Genetics
- ANSC 446 Population Genetics
- BIOP 401 Introduction to Biophysics
- BIOP 550 Biomolecular Physics
- CPSC 452 Advanced Plant Genetics
- CPSC 466 Genomics for Plant Improvement
- CPSC 554 Quantitative Genetics and Genomics
- CPSC 563 Chromosomes
- CPSC 566 Plant Gene Regulation
- MCB 400 Cancer Cell Biology
- MCB 450 Introductory Biochemistry
- MCB 501 Advanced Biochemistry
- MCB 502 Advanced Molecular and Cell Biology

Fundamental Bioinformatics (choose one):

- ANSC 542 Applied Bioinformatics
- ANSC 545 Statistical Genomics
- CHBE 571 Bioinformatics
- CPSC 567 Bioinformatics & Systems Biol
- CS 466 Introduction to Bioinformatics
- IB 467 Principles of Systematics
- MCB 432 Computing in Molecular Biology

Computer Science and Informatics (choose one): 4

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