**BIOINFORMATICS: CROP SCIENCE, MS**

for the Master of Science in Bioinformatics, Crop Science Concentration

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advisor: Nathan Schroeder  
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email: sdcarson@illinois.edu  
overview of grad college admissions & requirements: [https://grad.illinois.edu/admissions/apply](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  
phone:(217) 244-0396

**Graduate Degree Programs in Crop Sciences**  
**Crop Sciences, MS** ([http://catalog.illinois.edu/graduate/aces/crop-sciences-ms](http://catalog.illinois.edu/graduate/aces/crop-sciences-ms)) *(on campus & online)*  
**Bioinformatics: Crop Science, MS** *(p. 1)*  
**Plant Biotechnology, MS - Professional Science Masters** ([http://catalog.illinois.edu/graduate/aces/plant-biotechnology-ms-professional-science-masters](http://catalog.illinois.edu/graduate/aces/plant-biotechnology-ms-professional-science-masters))  
**Crop Sciences, PhD** ([http://catalog.illinois.edu/graduate/aces/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 biotechnology and medical research. For additional information, please see our website at [https://cropscommons.illinois.edu/graduate/](https://cropscommons.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, evidence of proficiency in basic science courses, 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](https://grad.illinois.edu/admissions/apply/begin/international). Results of the Graduate Record Examination (GRE) are required. Please see our web page for additional information: [https://cropscommons.illinois.edu/graduate/admissions/](https://cropscommons.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://cropscommons.illinois.edu/people/faculty/](https://cropscommons.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, letters of reference, and GRE scores.

for the Master of Science in Bioinformatics, Crop Science Concentration

The Crop Science 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](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](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>Biology (choose one)</td>
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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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<td>ANSC 446</td>
<td>Population Genetics</td>
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<td>BIOP 401</td>
<td>Introduction to Biophysics</td>
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<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 563</td>
<td>Chromosomes</td>
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<td>CPSC 564</td>
<td>Molecular Marker Data Analyses</td>
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<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>
<td>Introductory Biochemistry</td>
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<td>MCB 502</td>
<td>Advanced Molecular Genetics</td>
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<td>Fundamental Bioinformatics (choose one)</td>
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<td>ANSC 542</td>
<td>Applied Bioinformatics</td>
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<td>ANSC 545</td>
<td>Statistical Genomics</td>
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<td>CHBE 571</td>
<td>Bioinformatics</td>
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<td>CPSC 567</td>
<td>Bioinformatics &amp; Systems Biol</td>
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<td>CS 466</td>
<td>Introduction to Bioinformatics</td>
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<td>IB 467</td>
<td>Principles of Systematics</td>
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<td>MCB 432</td>
<td>Computing in Molecular Biology</td>
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Computer Science and Informatics (choose one) 4
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 542 Research and Inquiry for Youth
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)
Electives 16
CPSC 599 Thesis Research or PLPA 599 Thesis Research
Total Hours 32

Other Requirements
Code Title Hours
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
Biology (choose one) 4
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 563 Chromosomes
CPSC 564 Molecular Marker Data Analyses
CPSC 566 Plant Gene Regulation
MCB 400 Cancer Cell Biology
MCB 450 Introductory Biochemistry
MCB 501 Advanced Biochemistry
MCB 502 Advanced Molecular Genetics
Fundamental Bioinformatics (choose one) 4
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
CS 411 Database Systems
CS 473 Algorithms
CPSC 565 Perl & UNIX for Bioinformatics
IS 455 Database Design and Prototyping
IS 542 Research and Inquiry for Youth
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)
Electives 24
Total Hours 36

Other Requirements
Code Title Hours
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

Information listed in this catalog is current as of 03/2020