

BIOINFORMATICS: ANIMAL SCIENCES, MS

for the Master of Science in Bioinformatics, Animal Sciences Concentration

Research Areas

The Department of Animal Sciences offers graduate studies with a focus on bioinformatics, quantitative and computational biology, leading to the Master of Bioinformatics. Fields of bioinformatics application and specialization include:

- animal breeding, genetics, and bioinformatics
- animal behavior
- environmental, lactation, and reproductive physiology
- immunobiology
- meat science and muscle biology
- microbiology
- nutrition
- systems of animal management and production, precision management

Beef and dairy cattle, horses, poultry, sheep, swine, and companion and laboratory animals are available for study. Experience in teaching, extension, or outreach is encouraged as part of the academic work.

Admission

Candidates for admission to the M.Sc. in Bioinformatics program must have a bachelor's degree from an accredited institution equivalent to those from the University of Illinois Urbana-Champaign. A grade point average of 3.0 or higher (A = 4.0) for the last two years of undergraduate work and for any graduate study is required for admission. Candidates for admission who have a GPA between 2.75 and 2.99 can request special consideration of the application materials submitted. Graduate Record Examination (GRE) scores are not required for admission. English proficiency requirements for admission follow Graduate College requirements. Application materials include baccalaureate degree transcripts, a resume, a personal statement, and three letters of recommendation. Admission is possible for fall (mid-August), spring (mid-January), and summer (mid-June) semesters. Candidates for admission are encouraged to submit the complete application package no later than 2 months before the start of the desired admission semester.

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For additional details and requirements refer to the department's Graduate Handbook (<https://ansc.illinois.edu/academics/graduate-degrees/>) and the Graduate College Handbook (<http://www.grad.illinois.edu/gradhandbook/>).

Thesis Option

| Code | Title | Hours |
|----------------------|-------------------------|-------|
| Biology (choose one) | | 4 |
| ANSC 441 | Human Genetics | |
| ANSC 444 | Applied Animal Genetics | |

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| 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 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) | | 4 |
| ANSC 542 | Applied Bioinformatics | |
| ANSC 545 | | |
| 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 466 | Introduction to Bioinformatics | |
| CS 473 | Algorithms | |
| CPSC 565 | | |
| 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 | Big Data Analytics | |
| STAT 525 | Topics in Computational Statistics | |
| Graduate seminar (ANSC 590) enrollment is required every semester (max 2 hours can be applied to the degree) | | 2 |
| ANSC 599 | Thesis Research (min/max applied toward degree) | 8 |
| Electives | | 14 |
| Total Hours | | 36 |

Other Requirements

| Requirement |
|---|
| Other Requirements and conditions may overlap |
| A concentration is required. |
| Minimum Hours Overall Required Within the Unit: 8 |
| Minimum 500-level Hours Required Overall: 12 |
| A comprehensive oral examination concerning the thesis and other areas of Bioinformatics and Animal Sciences is required. |
| Thesis Deposit Required: Yes |
| Minimum GPA: 3.0 |

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1. Graduate-level understanding of essential concepts and approaches in the area of bioinformatics with application to animal sciences. The

essential bioinformatics concepts will enable the graduate to secure a mid-management position in industry or federal agencies or pursue Ph.D. studies and to advance throughout the professional ranks.

2. Capacity to execute supervised thesis research including:
 - a. understanding of the scientific method, research objectives, materials and methods, advanced data analysis, and appreciation of the findings; and
 - b. leadership on the implementation of essential research activities.
3. Ability to effectively communicate essential bioinformatics and animal sciences knowledge and thesis research findings in oral and written formats.
4. Aptitude to advocate for interdisciplinary research and education efforts to advance food security, food safety, animals and human health and wellbeing or environmental stewardship.

Graduate Degree Programs in Animal Sciences

Graduate Majors:

- Animal Sciences, MANSC (<http://catalog.illinois.edu/graduate/aces/animal-sciences-mansc/>)
- Animal Sciences, MS (<http://catalog.illinois.edu/graduate/aces/animal-sciences-ms/>)
- Animal Sciences, PhD (<http://catalog.illinois.edu/graduate/aces/animal-sciences-phd/>)

Graduate Concentrations:

- Bioinformatics: Animal Sciences, MS (p. 1)

for the Master of Science in Bioinformatics, Animal Sciences Concentration

Department of Animal Sciences

Director of Graduate Studies: Sandra Rodriguez Zas
(rodrgzs@illinois.edu)

Program Website (<https://ansc.illinois.edu/academics/graduate-degrees/>)

Department Faculty (<https://ansc.illinois.edu/directory/>)

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1207 West Gregory Drive
Urbana, IL 61801
(217) 333-3131
ansc-gradprog@illinois.edu

College of Agricultural, Consumer & Environmental Sciences

College Website (<https://aces.illinois.edu/>)

Admissions

Graduate College Admissions & Requirements (<https://grad.illinois.edu/admissions/apply/>)