

# BIOINFORMATICS: ANIMAL SCIENCES, MS

*for the Master of Science in Bioinformatics, Animal Sciences Concentration*

## 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)

## 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 at 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. 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, resume, personal statement, and three letters of recommendation. Admission is possible for fall, spring, and summer semesters.

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For additional details and requirements refer to the department's Graduate Handbook (<http://ansci.illinois.edu/grads/degree-requirements/>) and the Graduate College Handbook (<http://www.grad.illinois.edu/gradhandbook/>).

## Thesis Option

Code	Title	Hours
Biology (choose one)		
ANSC 441	Human Genetics	4
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 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	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 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	Big Data Analytics	
STAT 525	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
<b>Total Hours</b>		<b>36</b>

**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.

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department head: Rodney Johnson

graduate program coordinator: Sandra Rodriguez-Zas

**department website:** <https://ansc.illinois.edu>

**department faculty:** <https://ansc.illinois.edu/directory/faculty/>

**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:** 110 Animal Sciences Laboratory, 1207 West Gregory Drive, Urbana, IL 61801

**phone:** (217) 333-3131

**email:** [ansc-gradprog@illinois.edu](mailto:ansc-gradprog@illinois.edu) ([ansci-gradprog@illinois.edu](mailto:ansci-gradprog@illinois.edu))