ANIMAL SCIENCES, PH.D.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS
Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/policiesandrequirementstext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit</td>
<td>51 credits</td>
</tr>
<tr>
<td>Minimum Residence</td>
<td>32 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework</td>
<td>Half of degree coursework (26 credits out of 51 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
<tr>
<td>Overall Graduate GPA</td>
<td>3.00 GPA required.</td>
</tr>
</tbody>
</table>

OTHER GRADE REQUIREMENTS
The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

ASSESSMENTS AND EXAMINATIONS
The original research conducted by the candidate must be summarized in a thesis. A final examination will be given after the completion of the thesis. The thesis must be submitted to the examining committee two weeks before the examination. The candidate is required to present an exit seminar on their dissertation research and to subsequently defend the thesis orally. The thesis must be acceptable from both scientific and literary standpoints. The mentoring committee administers the thesis defense. Deposit of the doctoral dissertation in the Graduate School is required.

LANGUAGE REQUIREMENTS
Language requirements are determined on an individual basis with the major professor and will depend on the area of concentration within the department.

DOCTORAL MINOR/BREADTH REQUIREMENTS
The Animal Sciences program requires Ph.D. students to complete a minor.

REQUIRED COURSES
All Animal Sciences Ph.D. students must meet with their research committee during their first year to complete their Certification Form (http://www.ansci.wisc.edu/cgstudentt.html). Once the committee has approved the certification paperwork the student must turn in the signed copy to the Graduate Coordinator so that it may be reviewed and approved by the graduate chair. The certification paperwork must be approved before a student can request their prelim warrant. Students should meet with their committee once per year. Any changes to the certification paperwork must be communicated to the graduate coordinator and approved by the graduate chair.

Students graduating with a Ph.D. in Animal Sciences are expected to have core education in the following areas:

- Physiology/endocrinology/reproduction
- Biochemistry/nutrition
- Genetics/breeding
- Food science/meat science/food safety/microbiology
- STAT/F&W ECOL/HORT 571 Statistical Methods for Bioscience I
- STAT/F&W ECOL/HORT 572 Statistical Methods for Bioscience II, or equivalent
- A course in ethics
- Teaching practicum with Delta or MIU Workshop training.

Courses taken prior to entering the Animal Sciences program will be considered as a substitute.

SEMINAR REQUIREMENT
The Animal Sciences Graduate seminar features outside speakers, UW faculty, and Animal Sciences graduate students presenting their research or defending their thesis. This course is held on Tuesday mornings during the fall semester from 11 a.m. to noon. Attendance is required at this seminar series by all Animal Sciences graduate students. Ph.D. students are required to register for the AN SCI 875 Special Topics (Animal Science
Seminar) for credit twice. Although attendance is required, registering for the seminar for credit is done the semester a student presents.

**Teaching Requirement**

All students in the Animal Sciences Ph.D. program are required to complete a Teaching Practicum, usually AN SCI 799 Practicum in Animal Sciences Teaching. Each student is expected to work with the faculty advisor to identify an opportunity within the department for the student to engage in teaching. This requirement is broadly defined, and could include assisting an Animal Sciences faculty member with classroom teaching or TA’ing in a course outside of the department.

**Enrollment Requirement**

The program requires all funded students to be enrolled full time. For M.S. students this means at least 8 credits in the fall and spring term and at least 2 credits in the summer term. Students funded by another program should check with the payroll and benefits coordinator of that department to learn their requirements for enrollment. Unfunded students should follow the Graduate School's rules on enrollment ([https://grad.wisc.edu/documents/enrollment-requirements/](https://grad.wisc.edu/documents/enrollment-requirements/)).

The remainder of the course requirements for the Ph.D. in Animal Sciences will be selected to meet the student’s specific needs and to ensure breadth and depth as determined through consultation with his/her major professor and members of their committee.

**Animal Nutrition Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN SCI/DY SCI 824 &amp; AN SCI/DY SCI 825</td>
<td>Ruminant Nutritional Physiology I and Ruminant Nutritional Physiology II</td>
<td></td>
</tr>
<tr>
<td>AN SCI/DY SCI 831</td>
<td>Seminar in Animal Nutrition</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI/BIOCHEM 619</td>
<td>Advanced Nutrition: Intermediary</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 623</td>
<td>Advanced Nutrition: Minerals</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 627</td>
<td>Advanced Nutrition: Vitamins</td>
<td></td>
</tr>
<tr>
<td>COMP BIO 506</td>
<td>Veterinary Physiology B</td>
<td></td>
</tr>
<tr>
<td>COMP BIO 551</td>
<td>Veterinary Physiology A</td>
<td></td>
</tr>
</tbody>
</table>

1 These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2 These degree programs are supported by the Animal Nutrition Emphasis Group in the IGPNS program ([https://nutrisci.wisc.edu/graduate/m-s-Ph-D/animal-nutrition-emphasis-group/](https://nutrisci.wisc.edu/graduate/m-s-Ph-D/animal-nutrition-emphasis-group/)). Animal Sciences faculty members also have the option of offering an M.S. or Ph.D. degree in Nutritional Sciences as members of the Animal Nutrition Emphasis Group in IGPNS.

**Animal Breeding & Genetics Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN SCI/DY SCI GENETICS 951</td>
<td>Seminar in Animal Breeding (every semester)</td>
<td></td>
</tr>
<tr>
<td>GENETICS 466</td>
<td>Principles of Genetics</td>
<td></td>
</tr>
</tbody>
</table>

**Endocrinology & Reproductive Physiology Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT/F&amp;W ECOL/HORT 571 &amp; STAT/F&amp;W ECOL/HORT 572</td>
<td>Statistical Methods for Bioscience I and Statistical Methods for Bioscience II</td>
<td></td>
</tr>
<tr>
<td>AN SCI 610</td>
<td>Quantitative Genetics</td>
<td></td>
</tr>
<tr>
<td>AN SCI 875</td>
<td>Special Topics (Linear Models for Quantitative Genetics or Molecular Genetics for Animal Breeding)</td>
<td></td>
</tr>
</tbody>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN SCI 875</td>
<td>Special Topics (Endocrine Physiology)</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/PHEMOCOL-M/ZOOLOGY 630</td>
<td>Cellular Signal Transduction Mechanisms</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 507 &amp; BIOCHEM 508</td>
<td>General Biochemistry I and General Biochemistry II</td>
<td></td>
</tr>
<tr>
<td>BMOLCHEM 503</td>
<td>Human Biochemistry</td>
<td></td>
</tr>
<tr>
<td>AN SCI/OBS&amp;GYN/ZOOLOGY 954</td>
<td>Seminar in Endocrinology-Reproductive Physiology</td>
<td></td>
</tr>
<tr>
<td>F. Technical Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Advanced Statistics</td>
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<td></td>
</tr>
<tr>
<td>H. Advanced Endocrinology</td>
<td></td>
<td></td>
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<tr>
<td>I. Advanced Reproduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Advanced Topic Course. Select one of the following: Gamete and Embryo Biology, Reproductive Patterns, Selected Topics in Endocrinology-Reproductive Physiology, Pregnancy, Parturition, and Lactation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Meat Science & Muscle Biology Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN SCI/FOOD SCI 305</td>
<td>Introduction to Meat Science and Technology⁷</td>
<td>2</td>
</tr>
<tr>
<td>AN SCI 508</td>
<td>Poultry Products Technology⁷</td>
<td>2</td>
</tr>
<tr>
<td>AN SCI/FOOD SCI 515</td>
<td>Commercial Meat Processing⁷</td>
<td>2</td>
</tr>
<tr>
<td>AN SCI/FOOD SCI 710</td>
<td>Chemistry of the Food Lipids</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 501</td>
<td>Introduction to Biochemistry</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 507</td>
<td>General Biochemistry I</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 508</td>
<td>General Biochemistry II</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/NUTR SCI 510</td>
<td>Nutritional Biochemistry and Metabolism</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 550</td>
<td>Principles of Human Disease and Biotechnology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 601</td>
<td>Protein and Enzyme Structure and Function</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM GENETICS/ MD GENET 620</td>
<td>Eukaryotic Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 624</td>
<td>Mechanisms of Enzyme Action</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/PHMCOL-M/ZOOLOGY 630</td>
<td>Cellular Signal Transduction and Mechanisms</td>
<td></td>
</tr>
<tr>
<td>CHEM 565</td>
<td>Biophysical Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 721</td>
<td>Instrumental Analysis</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 410</td>
<td>Food Chemistry</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 412</td>
<td>Food Analysis</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 432</td>
<td>Principles of Food Preservation</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 440</td>
<td>Principles of Food Engineering</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 514</td>
<td>Integrated Food Functionality</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 532</td>
<td>Integrated Food Manufacturing</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 550</td>
<td>Fermented Foods and Beverages</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI 610</td>
<td>Food Proteins</td>
<td></td>
</tr>
<tr>
<td>FOOD SCI/BSE 642</td>
<td>Food and Pharmaceutical Separations</td>
<td></td>
</tr>
<tr>
<td>MICROBIO/FOOD SCI 324</td>
<td>Food Microbiology Laboratory</td>
<td></td>
</tr>
<tr>
<td>MICROBIO/FOOD SCI 325</td>
<td>Food Microbiology</td>
<td></td>
</tr>
<tr>
<td>MICROBIO 526</td>
<td>Physiology of Microorganisms</td>
<td></td>
</tr>
<tr>
<td>MICROBIO 527</td>
<td>Advanced Laboratory Techniques in Microbiology</td>
<td></td>
</tr>
<tr>
<td>MICROBIO 607</td>
<td>Advanced Microbial Genetics</td>
<td></td>
</tr>
<tr>
<td>M M &amp; I/PATH-BIO 528</td>
<td>Immunology</td>
<td></td>
</tr>
<tr>
<td>PATH-BIO/HORT 500</td>
<td>Molecular Biology Techniques</td>
<td></td>
</tr>
<tr>
<td>STAT/F&amp;W ECOL/HORT 571</td>
<td>Statistical Methods for Bioscience I</td>
<td></td>
</tr>
<tr>
<td>STAT/F&amp;W ECOL/HORT 572</td>
<td>Statistical Methods for Bioscience II</td>
<td></td>
</tr>
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2. Only one course from this group can be counted towards the credit load required in this section.
3. Required if an equivalent statistics course was not taken previously.