

# ANIMAL SCIENCE, BACHELOR OF SCIENCE

## College of Agricultural & Environmental Sciences

Anne Todgham, Ph.D., Chairperson of the Department

The Animal Science major is devoted to the sciences central to understanding biological function of domestic and captive animals, their care, management, and utilization by people for food, fiber, companionship, work, and recreation. Advances in science and technology, and an ever-growing human population, have increased the complexity of issues surrounding the care and management of animals. Specializations within the major allow students to develop a scientific appreciation of animals and their relationship to their environment. Graduates in Animal Science are able to advance the science and technology of animal care and management in an objective and effective manner for the betterment of animals and society.

## The Program

The curriculum provides depth in the biological and physiological sciences and allows students to specialize within the broad field of applied animal science. Study begins with introductory courses in animal science, biology, chemistry, mathematics, and statistics. Students undertake advanced courses in animal behavior, animal welfare, biochemistry, genetics, nutrition, and physiology and the integration of these sciences to animal growth, production, and performance. Students complete the curriculum by choosing a specialization in either an animal science discipline (behavior, biochemistry, genetics, nutrition, or physiology) or in the sciences particular to a class of animals (aquatic, avian, companion and captive, equine, laboratory, livestock and dairy, or poultry).

## Career Alternatives

A wide range of career opportunities are available to graduates. The primary goal of the major is to prepare students for graduate study leading to M.S. and Ph.D. degrees; for continued study in a professional school such as veterinary medicine, human medicine, or dentistry; for careers in research, agricultural production, farm and ranch management, or positions in business, sales, financial services, health care, agricultural extension, consulting services, teaching, journalism, or laboratory technology.

## Graduate Study

The Animal Biology Graduate Group offers a program of study and research leading to M.S. or Ph.D. degrees in Animal Biology. See Animal Biology (Graduate Group) (<https://catalog.ucdavis.edu/departments-programs-degrees/animal-biology-graduate-group/>); see also Graduate Studies (<http://gradstudies.ucdavis.edu/>).

## Lead Faculty Advisor

Russ Hovey, Ph.D., Professor

The major requirements below are in addition to meeting University Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/>) & College Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/college-degree-requirements/>); unless otherwise noted. The minimum

number of units required for the Animal Science Bachelor of Science is 117.

| Code   | Title   | Units |
|--|---|-------|
| <b>Preparatory Subject Matter</b>  |   |       |
| <i>Animal Science</i>  |   | 12    |
| ANS 001  | Domestic Animals & People <sup>1</sup>  |       |
| ANS 002  | Introductory Animal Science   |       |
| ANS 041  | Domestic Animal Production <sup>2</sup>   |       |
| ANS 041L   | Domestic Animal Production Laboratory <sup>2</sup>  |       |
| <i>Biological Science</i>  |   | 15    |
| BIS 002A   | Introduction to Biology: Essentials of Life on Earth  |       |
| BIS 002B   | Introduction to Biology: Principles of Ecology & Evolution                                    |       |
| BIS 002C   | Introduction to Biology: Biodiversity & the Tree of Life                                      |       |
| <i>Chemistry; choose 002 series &amp; 008 series or 118 series:</i>  |   | 16-18 |
| CHE 002A & CHE 002B  | General Chemistry and General Chemistry   |       |
| <b>AND</b>   |   |       |
| CHE 008A & CHE 008B  | Organic Chemistry: Brief Course and Organic Chemistry: Brief Course                           |       |
| <b>OR</b>  |   |       |
| CHE 118A & CHE 118B  | Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences |       |
| <i>Mathematics; choose a series:</i>   |   | 6-8   |
| MAT 016A & MAT 016B DISCO  | and (Discontinued)  |       |
| MAT 017A & MAT 017B  | Calculus for Biology & Medicine and Calculus for Biology & Medicine                           |       |
| MAT 019A & MAT 019B  | Calculus for Data-Driven Applications and Calculus for Data-Driven Applications               |       |
| MAT 021A & MAT 021B  | Calculus and Calculus   |       |
| Choose one:  |   | 4     |
| PLS 120  | Applied Statistics in Agricultural Sciences   |       |
| STA 100  | Applied Statistics for Biological Sciences  |       |
| Note: Some professional and graduate schools may require additional preparatory subject matter; consult the Advising Center. |   |       |
| Preparatory Subject Matter Subtotal  |   | 53-57 |
| <b>Depth Subject Matter</b>  |   |       |
| <i>Biology</i>   |   | 44    |
| BIS 101 or BIS 101V  | Genes & Gene Expression   |       |
| ANG 107  | Genetics & Animal Breeding  |       |
| ABI 102  | Animal Biochemistry & Metabolism  |       |
| ABI 103  | Animal Biochemistry & Metabolism  |       |
| NPB 101 or ANS 100   | Systemic Physiology and Animal Physiology   |       |
| ANS 104  | Principles & Applications of Domestic Animal Behavior   |       |

|         |   |
|---------|---|
| ANS 150 | Animal Health & Disease                   |
| ANS 170 | Ethics of Animal Use                      |
| NUT 115 | Animal Nutrition                          |
| NUT 141 | Comparative Animal Nutrition & Metabolism |

**Integrative Animal Biology Restricted Electives:**

For Companion & Captive, Disciplinary Focus-Behavior, Disciplinary Focus-Biochemistry, Disciplinary Focus-Genetics, Disciplinary Focus-Nutrition, Disciplinary Focus-Physiology, Equine Science, Laboratory Animals, and Livestock & Dairy specializations: must take two from the following list: 6-8

|         |                                    |
|---------|------------------------------------|
| ANS 123 | Animal Growth & Development        |
| ANS 124 | Lactation                          |
| NPB 121 | Physiology of Reproduction         |
| NPB 130 | Physiology of the Endocrine Glands |

For Aquatic Animal specialization; must take two from the following list:

|                 |                                   |
|-----------------|-----------------------------------|
| ANS 123         | Animal Growth & Development       |
| EVE 112         | Biology of Invertebrates          |
| NPB 123/APC 100 | Comparative Vertebrate Organology |
| WFC 120         | Biology & Conservation of Fishes  |

For Avian Sciences & Poultry specializations; must take two from the following list:

|         |                                    |
|---------|------------------------------------|
| ANS 123 | Animal Growth & Development        |
| AVS 100 | Avian Biology                      |
| NPB 117 | Avian Physiology                   |
| NPB 130 | Physiology of the Endocrine Glands |

**Laboratory**

Choose one: 2-6

|          |   |
|----------|---|
| ANG 111  | Molecular Biology Laboratory Techniques     |
| ANS 106  | Domestic Animal Behavior Laboratory         |
| ANS 133  | Animal Cell Culture Laboratory              |
| ANS 134  | Animal Nutrition Laboratory                 |
| ANS 135  | Production Animal Laboratory                |
| ANS 136  | Techniques & Practices of Fish Culture      |
| ANS 137  | Techniques & Practices of Avian Culture     |
| ANS 139  | Experimental Animal Physiology              |
| MCB 120L | Molecular Biology & Biochemistry Laboratory |
| MCB 160L | Principles of Genetics Laboratory           |
| NPB 101L | Systemic Physiology Laboratory              |
| NPB 104L | Cellular Physiology/Neurobiology Laboratory |
| PMI 126L | Immunology Laboratory                       |

Depth Subject Matter Subtotal 52-58

**Area of Specialization**

Choose one area of specialization below: 12

The program of study must be approved in advance by your faculty advisor. Courses must be taken for a letter grade.

|  |
|--|
| Aquatic Animals (p. 2)                 |
| Avian Sciences (p. 2)                  |
| Companion & Captive Animals (p. 2)     |
| Disciplinary Focus—Behavior (p. 2)     |
| Disciplinary Focus—Biochemistry (p. 2) |

|                                      |                |
|--------------------------------------|----------------|
| Disciplinary Focus—Genetics (p. 2)   |                |
| Disciplinary Focus—Nutrition (p. 2)  |                |
| Disciplinary Focus—Physiology (p. 3) |                |
| Equine Science (p. 3)                |                |
| Laboratory Animals (p. 3)            |                |
| Livestock & Dairy (p. 3)             |                |
| Poultry (p. 3)                       |                |
| Area of Specialization Subtotal      | 12             |
| <b>Total Units</b>                   | <b>117-127</b> |

1

ANS 001 will be waived for junior transfer students.

2

ANS 041, ANS 041L will be waived for junior transfer students.

**Aquatic Animals Specialization**

| Code  | Title                    | Units |
|---|--------------------------|-------|
| ANS 018   | Introductory Aquaculture | 4     |
| Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. |                          | 8     |

**Avian Sciences Specialization**

| Code  | Title                           | Units |
|---|---------------------------------|-------|
| AVS 013   | Birds, Humans & the Environment | 3     |
| Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. |                                 | 9     |

**Companion & Captive Animals Specialization**

| Code  | Title                                 | Units |
|---|---------------------------------------|-------|
| ANS 042   | Introductory Companion Animal Biology | 4     |
| ANS 142   | Companion Animal Care & Management    | 4     |
| Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. |                                       | 4     |

**Disciplinary Focus—Behavior Specialization**

| Code   | Title | Units |
|--|-------|-------|
| Select upper division units with approval from your faculty advisor, to form a coherent series of courses. |       | 12    |

**Disciplinary Focus—Biochemistry Specialization**

| Code   | Title | Units |
|--|-------|-------|
| Select upper division units with approval from your faculty advisor, to form a coherent series of courses. |       | 12    |

**Disciplinary Focus—Genetics Specialization**

| Code   | Title | Units |
|--|-------|-------|
| Select upper division units with approval from your faculty advisor, to form a coherent series of courses. |       | 12    |

**Disciplinary Focus—Nutrition Specialization**

| Code   | Title | Units |
|--|-------|-------|
| Select upper division units with approval from your faculty advisor, to form a coherent series of courses. |       | 12    |

### Disciplinary Focus—Physiology Specialization

| Code | Title  | Units |
|------|--|-------|
|      | Select upper division units with approval from your faculty advisor, to form a coherent series of courses. | 12    |

### Equine Science Specialization

| Code    | Title   | Units |
|---------|---|-------|
| ANS 015 | Introductory Horse Husbandry  | 3     |
| ANS 115 | Advanced Horse Production   | 4     |
|         | Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. | 5     |

### Laboratory Animals Specialization

| Code    | Title   | Units |
|---------|---|-------|
| ANS 042 | Introductory Companion Animal Biology   | 4     |
| ANS 140 | Management of Laboratory Animals  | 4     |
|         | Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. | 4     |

### Livestock & Dairy Specialization

| Code    | Title   | Units |
|---------|---|-------|
|         | Choose two:   | 8-9   |
| ANS 143 | Pig & Poultry Care & Management   |       |
| ANS 144 | Beef Cattle & Sheep Production  |       |
| ANS 146 | Dairy Cattle Production   |       |
|         | Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. | 3-4   |

### Poultry Specialization

| Code    | Title   | Units |
|---------|---|-------|
| AVS 011 | Introduction to Poultry Science   | 3     |
| ANS 143 | Pig & Poultry Care & Management   | 4     |
|         | Select additional upper division units with approval from your faculty advisor, to form a coherent series of courses. | 5     |