ANIMAL SCIENCE CURRICULUM
Major requirements for first year students entering in Fall 2018.

CORE COURSEWORK

Foundational competency
ANSC 1101 Contemporary Perspectives in Animal Science 1
BIOAP 1100 Domestic Animal Biology 4
ANSC 2120 Animal Nutrition 4
ANSC 2210 Principles of Animal Genetics 4
ANSC 2400 Animal Reproduction and Development 3

Fundamentals of Animal Management
One of the following:
ANSC 2500 Dairy Cattle Principles 3
ANSC 2650 Equine Biology and Management 3
ANSC 3600 Beef Cattle (offered in even-numbered years only) 3
ANSC 3800 Sheep (offered in odd-numbered years only) 3

Professional values and responsibility:
ANSC 1105 Careers in Animal Science 1

One of the following:
ANSC 3100 Introduction to Animal Welfare 2
ANSC 4140 Ethics and Animal Science 2

ePortfolio: All students will design an ePortfolio showcasing their learning experience and highlighting plans as they progress through the Animal Science major. The ePortfolios need to be updated and presented to Faculty advisors at the end of each semester. A primer for launching ePortfolios will be part of ANSC 1101.

CONCENTRATIONS

1. Animal Biology and Management
2. Integrative Physiology and Nutrition
3. Pre-veterinary Medicine
4. Dairy Management
1. ANIMAL BIOLOGY AND MANAGEMENT

**Nutrition and Metabolism**
*One of the following*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANSC 3200</td>
<td>Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More</td>
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<tr>
<td>ANSC 3550</td>
<td>Dairy Cattle Nutrition</td>
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<tr>
<td>ANSC</td>
<td>Nutritional Physiology and Biochemistry</td>
<td>3</td>
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<tr>
<td>ANSC 4110</td>
<td>Integrated Cattle Nutrition</td>
<td>3</td>
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**Animal Physiology**
*Two of the following*

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<th>Course Title</th>
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<tr>
<td>ANSC 3300</td>
<td>Fish Physiology</td>
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<td>ANSC 3410</td>
<td>Biology of the Mammary Gland in Health and Disease</td>
<td>2</td>
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<tr>
<td>ANSC 3400</td>
<td>Comparative Mammalian Reproduction</td>
<td>2</td>
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<tr>
<td>ANSC 3700</td>
<td>Immunology in Animal Health and Disease</td>
<td>3</td>
</tr>
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<td>ANSC 3920</td>
<td>Mechanisms of Animal Growth and Development</td>
<td>2</td>
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<td>BIOAP 42700</td>
<td>Endocrinology</td>
<td>3</td>
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**Animal Management**
*Three of the following (excluding the selected core course)*

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<tr>
<td>ANSC 2150</td>
<td>Exotic Avian Biology and Management</td>
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<tr>
<td>ANSC 2300</td>
<td>Introduction to Domestic Mammalian Behavior</td>
<td>2</td>
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<tr>
<td>ANSC 2500</td>
<td>Dairy Cattle Principles</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 2650</td>
<td>Equine Biology and Management</td>
<td>3</td>
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<tr>
<td>ANSC 3450</td>
<td>Reproductive Physiology and Management of Dairy Cattle</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 3500</td>
<td>Meat</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 3600</td>
<td>Beef Cattle <em>(offered in even-numbered years only)</em></td>
<td>3</td>
</tr>
<tr>
<td>ANSC 3800</td>
<td>Sheep <em>(offered in odd-numbered years only)</em></td>
<td>3</td>
</tr>
<tr>
<td>ANSC 3980</td>
<td>Animals in Biomedical Research</td>
<td>2</td>
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**Chemistry:**

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<th>Course Title</th>
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<tr>
<td>CHEM 1560</td>
<td>Introduction to General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1570</td>
<td>Introduction to Organic and Biological Chemistry</td>
<td>3</td>
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</table>

**Quantitative Reasoning:**
*One of the following:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 1106</td>
<td>Calculus for the Life and Social Sciences</td>
<td>3</td>
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<tr>
<td>MATH 1110</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 1710</td>
<td>Statistical Theory and Application in the Real World</td>
<td>4</td>
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<tr>
<td>STSCI 2100</td>
<td>Introductory Statistics</td>
<td>4</td>
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<tr>
<td>STSCI 2150</td>
<td>Introductory Statistics for Biology</td>
<td>4</td>
</tr>
<tr>
<td>STSCI 2200</td>
<td>Biological Statistics I</td>
<td>4</td>
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</tbody>
</table>

* BTRY 3010 and BTRY 3020 sequence is also acceptable for students interested in pursuing statistics in depth.
**Economics/Finance:**
*One of the following:*
AEM 1200 Introduction to Business Management 3
AEM 1500 An Introduction to the Economics of Environmental and Natural Resources 3
AEM 2050 Introduction to Agricultural and Development Finance 3
AEM 2210 Financial Accounting 3
ECON 1110 Introductory Microeconomics 3
ECON 1120 Introductory Macroeconomics 3
HADM 2230 Financial Accounting Principles 3
HADM 2250 Finance 3

**Grand Challenge and Discovery:**
*One of the courses from List A*

**Breadth in life sciences:**
*One of the courses from List B*

**Other recommended courses:**
*Courses from List C*
2. INTEGRATIVE PHYSIOLOGY AND NUTRITION

Core requisites:
BIOAP 4110 Nutritional Physiology and Biochemistry 3
BIOAP 4270 Endocrinology 3

Animal Physiology and Nutrition (Three of the following):
ANSC 3200 Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More 4
BIOAP 3300 Fish Physiology 3
ANSC 3400 Comparative Mammalian Reproduction 2
ANSC 3410 Biology of the Mammary Gland in Health and Disease 2
(offered in even-numbered years only)
ANSC 3700 Immunology in Animal Health and Disease 3
ANSC 3920 Mechanisms of Growth and Development 2

Courses for pre-professional students (One of the following)
ANSC 3980 Animals in Biomedical Research 2
ANSC 4400 Tools for a Lifelong Career in Research 1

Chemistry:
CHEM 1560 Introduction to General Chemistry 4
CHEM 1570 Introduction to Organic and Biological Chemistry 3

Quantitative Reasoning:
One of the following:
MATH 1106 Calculus for the Life and Social Sciences 3
MATH 1110 Calculus I 4
MATH 1710 Statistical Theory and Application in the Real World 4
STSCI 2100 Introductory Statistics 4
STSCI 2150 Introductory Statistics for Biology 4
STSCI 2200 Biological Statistics I 4

* BTRY 3010 and BTRY 3020 sequence is also acceptable for students interested in pursuing statistics in depth.

Economics/Finance:
One of the following:
AEM 1200 Introduction to Business Management 3
AEM 1500 An Introduction to the Economics of Environmental and Natural Resources 3
AEM 2050 Introduction to Agricultural and Development Finance 3
AEM 2210 Financial Accounting 3
ECON 1110 Introductory Microeconomics 3
ECON 1120 Introductory Macroeconomics 3
HADM 2230 Financial Accounting Principles 3
HADM 2250 Finance 3
Grand Challenge and Discovery:
One of the courses from List A

Breadth in life sciences:
One of the courses from List B

Other recommended courses:
Courses from List C
3. PRE-VETERINARY MEDICINE*
(Also relevant for Pre-Medical)

**Biology requisites**

*One of the following:*
- BIOMG 1350  Cell and Developmental Biology  3
- BIOG 1440  Comparative Physiology  3
- BIOG 1445  Comparative Physiology *(Individualized instruction format)*  3

*Lab:*
- BIOG 1500  Investigative Biology Laboratory  2

**Animal Physiology and Nutrition (Three of the following)**
- BIOAP  Nutritional Physiology and Biochemistry  3
- ANSC 3200  Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More  3
- BIOAP 3300  Fish Physiology  3
- ANSC 3400  Comparative Mammalian Reproduction  2
- ANSC 3410  Biology of the Mammary Gland in Health and Disease *(offered in even-numbered years only)*  2
- BIOAP 4270  Endocrinology  3
- ANSC 3920  Mechanisms of Animal Growth and Development *(offered in odd-numbered years only)*  2

**Chemistry requisites**
- CHEM 2070  General Chemistry I *(Fall/Summer)*  4
- CHEM 2080  General Chemistry II *(Spring/Summer)*  4
- CHEM 3570  Organic Chemistry for the Life Sciences I *(Fall/Summer)*  3
- CHEM 3580  Organic Chemistry for the Life Sciences II *(Spring/Summer)*  3
- CHEM 2510  Introduction to Experimental Organic Chemistry *(Fall/Spring/Summer)*  2

**Biochemistry requisites**

Option 1:  
- BIOMG 3310  Principles of Biochemistry: Proteins and Metabolism  3
- BIOMG 3320  Principles of Biochemistry: Molecular Biology  2

Option 2:  
- BIOMG 3300  Principles of Biochemistry *(Individualized instruction format)*  4

**Quantitative Reasoning:**

*One of the following*
- MATH 1106  Calculus for the Life and Social Sciences  3
- MATH 1110  Calculus I  4
- MATH 1710  Statistical Theory and Application in the Real World  4
- STSCI 2100  Introductory Statistics  4
- STSCI 2150  Introductory Statistics for Biology  4
- STSCI 2200  Biological Statistics I  4
**Advanced Life Sciences**

*Two of the following*

- **ANSC 3700** Immunology in Animal Health and Disease 3
- **BIOMI 2900** General Microbiology Lectures 3
- **BIOMI 2911** General Microbiology Laboratory 3
- **BIOAP 3110** Principles of Animal Physiology 3
- **BIOAP 3190** Laboratory in Physiology 4
- **BIOAP 4130** Histology: The Biology of the Tissues 4

**Physics requisites**

Option 1:  
- PHYS 1101 General Physics I *(Individualized instruction format)* 4
  *(Fall/Summer)*
- PHYS 1102 General Physics II *(Individualized instruction format)* 4
  *(Spring/Summer)*

Option 2:  
- PHYS 2207 Fundamentals of Physics I *(Calculus-based)* 4 *(Fall)*
- PHYS 2208 Fundamentals of Physics II *(Calculus-based)* 4 *(Spring)*

Option 3:  
- PHYS 1112 Physics I: Mechanics and Heat 4 *(Fall/Spring/Summer)*
- PHYS 2208 Fundamentals of Physics II *(Calculus-based)* 4 *(Spring)*

*Requirements of veterinary schools do vary, please check with the vet school that you are applying for.

**Other recommended courses:**

*Courses from List C*
4. DAIRY MANAGEMENT

Prerequisite (under Animal Management distribution - does not count for concentration credits):

ANSC 2500 Dairy Cattle Principles 3

Core requisites:
ANSC 3510 Dairy Herd Management 4
ANSC 3540 Cattle Herd Health 3
ANSC 3550 Dairy Cattle Nutrition 3
ANSC 4510 Dairy Herd Business Management 3
ANSC 4560 Dairy Business and Enterprise Management 2
AEM 3020 Farm Business Management 4

Chemistry:
CHEM 1560 Introduction to General Chemistry 4

Quantitative Reasoning:
One of the following:* 
MATH 1106 Calculus for the Life and Social Sciences 3
MATH 1110 Calculus I 4
MATH 1710 Statistical Theory and Application in the Real World 4
STSCI 2100 Introductory Statistics 4
STSCI 2150 Introductory Statistics for Biology 4
STSCI 2200 Biological Statistics I 4

* BTRY 3010 and BTRY 3020 sequence is also acceptable for students interested in pursuing statistics in depth.

Economics/Finance:
Two of the following:
AEM 1200 Introduction to Business Management 3
ECON 1110 Introductory Microeconomics 3
ECON 1120 Introductory Macroeconomics 3
HADM 2230 Financial Accounting Principles 3
HADM 2250 Finance 3

Grand Challenge and Discovery:

One of the courses from List A

Breadth in life sciences:

One of the courses from List B
Other recommended courses:

ANSC 2550  Dairy Study Trip to Italy  R  
  (offered in odd-numbered years only)
ANSC 3310  Applied Dairy Cattle Genetics  2  
  (offered in odd-numbered years only)
ANSC 3410  Biology of the Mammary Gland in Health and Disease  2  
  (offered in even-numbered years only)
ANSC 3450  Reproductive Physiology and Management of Dairy Cattle  3
ANSC 3511  Dairy Enterprise and Industry Management  2
ANSC 3560  International Dairy Study Trip R  
  (offered in odd-numbered years only)
ANSC 4110  Integrated Cattle Nutrition  4
ANSC 4120  Whole Farm Nutrient Management  4
ANSC 4140  Ethics and Animal Science  2

AEM 1200  Introduction to Business Management  3
AEM 1500  An Introduction to the Economics of Environmental and Natural Resources  3
AEM 2050  Introduction to Agricultural and Developmental Finance  3
AEM 2210  Financial Accounting  3
AEM 3040  Dairy Markets and Policy  1

HADM 2230  Financial Accounting  3
HADM 2250  Finance  3
HADM 2740  Business Computing  3
HADM 3200  Personal Financial Management  3
HADM 4150  Practical Leadership: Foundations for a Career  (weekend course)  1

ILRHR 2600  Human Resource Management  3

NBA 3000  Entrepreneurship and Private Equity  3
NBA 5820  Family Business Management (7 week)  1

CSS 2110  Field Crop Systems  3
CSS 3150  Weed Biology and Management  4
CSS 3210  Soil and Crop Management for Sustainability  3
PLSCS 4303  The GMO Debate: Science and Society (every other year)  2
### LIST A – Grand Challenge and Discovery

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ANSC 4000</td>
<td>Feeding the World: The Biological and Quantitative Analyses of Livestock and Crop Systems 4</td>
</tr>
<tr>
<td>ANSC 4880</td>
<td>Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainability 3-4</td>
</tr>
<tr>
<td>BIOEE 4690</td>
<td>Food, Agriculture and Society 3</td>
</tr>
<tr>
<td>EAS 4400</td>
<td>Seminar on Climate Change Science, Impacts, and Mitigation 3</td>
</tr>
<tr>
<td>NTRES 4800</td>
<td>Global Seminar: Building Sustainable Environments and Secure Food Systems for a Modern World 3</td>
</tr>
<tr>
<td>NTRES 3300</td>
<td>Planning for Environmental Conservation and Sustainability 3</td>
</tr>
<tr>
<td>PLBRG 2010</td>
<td>Plants, Genes, and Global Food Production 3</td>
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<tr>
<td>PLSCI 1900</td>
<td>Sustainable Agriculture: Food, Farming and the Future 3</td>
</tr>
<tr>
<td>DSOC 3400</td>
<td>Agriculture, Food, Sustainability, and Social Justice 3</td>
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<tr>
<td>DSOC 3200</td>
<td>Rethinking Global Development: New Frameworks for Understanding Poverty, Inequality and Growth in 21C 3</td>
</tr>
<tr>
<td>Course Code</td>
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<tr>
<td>BIOEE 1610</td>
<td>Ecology and the Environment</td>
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<tr>
<td>BIOEE 1780</td>
<td>An Introduction to Evolutionary Biology and Diversity</td>
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<tr>
<td>BIOEE 2740</td>
<td>The Vertebrates: Comparative Anatomy, Function, and Evolution</td>
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<tr>
<td>BIOEE 2640</td>
<td>Tropical Field Ornithology (Multi-semester)</td>
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<tr>
<td>BIOMI 2900</td>
<td>General Microbiology Lectures</td>
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<tr>
<td>BIOSM 1500</td>
<td>Investigative Marine Biology Laboratory</td>
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<tr>
<td>BIOSM 1610</td>
<td>Ecology and the Marine Environment</td>
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<td>BIOSM 1780</td>
<td>Evolution and Marine Diversity</td>
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<td>BIOSM 1650</td>
<td>Marine Mammal Biology</td>
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<td>BME 2110</td>
<td>Biomolecular Thermodynamics and Physical Chemistry</td>
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<td>BME 2310</td>
<td>Biomedical Signals and Systems</td>
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<td>EAS 1600</td>
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<td>ENGRD 2202</td>
<td>Biomedical Transport Phenomena</td>
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<td>ENGRD 2020</td>
<td>Statics and Mechanics of Solids</td>
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<td>ENTOM 2120</td>
<td>Insect Biology</td>
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<td>FDSC 1500</td>
<td>Food Choices and Issues</td>
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<td>FDSC 2000</td>
<td>Introduction to Physicochemical and Biological Aspects of Food</td>
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<td>NS1150</td>
<td>Nutrition, Health and Society</td>
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<td>Society and Natural Resources</td>
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<td>Nature of Plants</td>
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<td>PLBIO 2410</td>
<td>Introductory Plant Biodiversity and Evolution</td>
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<td>Plant Function and Growth Lectures</td>
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<td>Evolutionary Plant Biology</td>
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<td>Plant Science and Systems</td>
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<tr>
<td>PLSCS 2600</td>
<td>Soil Science</td>
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<tr>
<td>VIEN 1104</td>
<td>Introduction to Wines and Vines</td>
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**LIST C – Animal Science Courses**

### Fall Courses:
- BIOAP 1100 - Domestic Animal Biology  
- ANSC 1101 - Contemporary Perspectives in Animal Science
- ANSC 2120 - Animal Nutrition
- ANSC 2150 - Exotic Avian Biology and Management
- ANSC 2550 - Dairy Study Trip to Italy (offered in odd-numbered years only) R
- ANSC 2650 - Equine Biology and Management
- ANSC 3100 - Introduction to Animal Welfare
- ANSC 3400 - Comparative Mammalian Reproduction
- ANSC 3500 - Meat
- ANSC 3540 - Dairy Cattle Herd Health
- ANSC 3550 - Dairy Study Trip to Italy II (offered in odd-numbered years only)
- ANSC 4000 - Feeding the World: The Biological and Quantitative Analyses of Livestock and Crop Systems
- ANSC 4110 - Integrated Cattle Nutrition
- ANSC 4270 - Fundamentals of Endocrinology
- ANSC 4400 - Tools for a Lifelong Career in Research
- ANSC 4510 - Dairy Herd Business Management
- ANSC 4880 - Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainability

### Spring Courses:
- ANSC 1105 - Careers in Animal Science
- ANSC 2210 - Principles of Animal Genetics
- ANSC 2300 - Introduction to Domestic Mammalian Behavior
- ANSC 2400 - Animal Reproduction and Development
- ANSC 2410 - Animal Reproduction and Development Lab
- ANSC 2500 - Dairy Cattle Principles
- ANSC 2551 - Dairy Study Trip to Italy II (offered in even-numbered years only)
- ANSC 3200 - Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More
- ANSC 3300 - Fish Physiology
- ANSC 3310 - Applied Dairy Cattle Genetics (offered in odd-numbered years only)
- ANSC 3410 - Biology of the Mammary Gland in Health and Disease (offered in even-numbered years only)
- ANSC 3450 - Reproductive Physiology and Management of Dairy Cattle
- ANSC 3510 - Dairy Herd Management
- ANSC 3511 - Junior Dairy Fellows
- ANSC 3550 - Dairy Cattle Nutrition
- ANSC 3561 - International Dairy Study Trip II (offered in even-numbered years only)
- ANSC 3600 - Beef Cattle (offered in even numbered years only)
- ANSC 3700 - Immunology in Animal Health and Disease
- ANSC 3800 - Sheep (offered in odd-numbered years only)
- ANSC 3920 - Mechanisms of Animal Growth and Development (offered in odd-numbered years only)
- ANSC 3980 - Animals in Biomedical Research (offered in odd-numbered years only)
ANSC 4020 - Seminar in Animal Sciences  1
ANSC 4120 - Whole-Farm Nutrient Management  4
ANSC 4140 - Ethics and Animal Science  2
ANSC 4560 - Dairy Management Fellowship  2

Other Animal Science Course Offerings:
ANSC 4940 - Special Topics in Animal Science
ANSC 4960 - Internship in Animal Science
ANSC 4970 - Individual Study in Animal Science
ANSC 4980 - Undergraduate Teaching in Animal Science
ANSC 4990 - Undergraduate Research in Animal Science