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

ANSC 3200	Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More	4
ANSC 3550	Dairy Cattle Nutrition	3
ANSC	Nutritional Physiology and Biochemistry	3
ANSC 4110	Integrated Cattle Nutrition	3

Animal Physiology

Two of the following

ANSC 3300	Fish Physiology	3
ANSC 3410	Biology of the Mammary Gland in Health and Disease *(offered in even- numbered years only)*	2
ANSC 3400	Comparative Mammalian Reproduction	2
ANSC 3700	Immunology in Animal Health and Disease	3
ANSC 3920	Mechanisms of Animal Growth and Development *(offered in odd- numbered years only)*	2
BIOAP 42700	Endocrinology	3

Animal Management

Three of the following (excluding the selected core course)

ANSC 2150	Exotic Avian Biology and Management	1
ANSC 2300	Introduction to Domestic Mammalian Behavior	2
ANSC 2500	Dairy Cattle Principles	3
ANSC 2650	Equine Biology and Management	3
ANSC 3450	Reproductive Physiology and Management of Dairy Cattle	3
ANSC 3500	Meat	3
ANSC 3600	Beef Cattle *(offered in even- numbered years only)*	3
ANSC 3800	Sheep *(offered in odd- numbered years only)*	3
ANSC 3980	Animals in Biomedical Research	2

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

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 *(offered in even- numbered years only)*	2
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

ANSC 4000	Feeding the World: The Biological and Quantitative Analyses of Livestock and Crop Systems	4
ANSC 4880	Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainability	3-4
BIOEE 4690	Food, Agriculture and Society	3
EAS 4400	Seminar on Climate Change Science, Impacts, and Mitigation	3
NTRES 4800	Global Seminar: Building Sustainable Environments and Secure Food Systems for a Modern World	3
NTRES 3300	Planning for Environmental Conservation and Sustainability	3
PLBRG 2010	Plants, Genes, and Global Food Production	3
PLSCI 1900	Sustainable Agriculture: Food, Farming and the Future	3
DSOC 3400	Agriculture, Food, Sustainability, and Social Justice	3
DSOC 3200	Rethinking Global Development: New Frameworks for Understanding Poverty, Inequality and Growth in 21C	3

LIST B – Breadth in Life Sciences

BIOEE 1610	Ecology and the Environment	3
BIOEE 1780	An Introduction to Evolutionary Biology and Diversity	3
BIOEE 2740	The Vertebrates: Comparative Anatomy, Function, and Evolution	3
BIOEE 2640	Tropical Field Ornithology (Multi-semester)	3
BIOMI 2900	General Microbiology Lectures	3
BIOSM 1500	Investigative Marine Biology Laboratory	3
BIOSM 1610	Ecology and the Marine Environment	3
BIOSM 1780	Evolution and Marine Diversity	4
BIOSM 1650	Marine Mammal Biology	3
BME 2110	Biomolecular Thermodynamics and Physical Chemistry	3
BME 2310	Biomedical Signals and Systems	3
EAS 1600	Environmental Physics	3
ENGRD 2202	Biomedical Transport Phenomena	3
ENGRD 2020	Statics and Mechanics of Solids	3
ENTOM 2120	Insect Biology	4
FDSC 1500	Food Choices and Issues	3
FDSC 2000	Introduction to Physicochemical and Biological Aspects of Food	3
FDSC 2100	Food Analysis	3
NS1150	Nutrition, Health and Society	3
NS 2750	Human Biology and Evolution	3
NTRES 1101	Introduction to Environmental Science and Sustainability	3
NTRES 2010	Environmental Conservation	3
NTRES 2100	Introductory Field Biology	4
NTRES 2201	Society and Natural Resources	3
NTRES 2670	Introduction to Conservation Biology	3
PLHRT 1115	Nature of Plants	3
PLBIO 2410	Introductory Plant Biodiversity and Evolution	3
PLBIO 2420	Plant Function and Growth Lectures	3
PLBIO 2440	Evolutionary Plant Biology	3
PLSCI 1101	Plant Science and Systems	4
PLSCS 2600	Soil Science	4
VIEN 1104	Introduction to Wines and Vines	3

LIST C – Animal Science Courses

Fall Courses:

BIOAP 1100- Domestic Animal Biology 4
ANSC 1101- Contemporary Perspectives in Animal Science 1
ANSC 2120 - Animal Nutrition 4
ANSC 2150 - Exotic Avian Biology and Management 1
ANSC 2550 - Dairy Study Trip to Italy *(offered in odd- numbered years only)* R
ANSC 2650 - Equine Biology and Management 3
ANSC 3100 - Introduction to Animal Welfare 2
ANSC 3400 - Comparative Mammalian Reproduction 2
ANSC 3500 – Meat 3
ANSC 3540 - Dairy Cattle Herd Health 3
ANSC 3560 - International Dairy Study Trip *(offered in odd- numbered years only)* R
ANSC 4000 - Feeding the World: The Biological and Quantitative Analyses of Livestock and Crop Systems 4
ANSC 4110 - Integrated Cattle Nutrition 4
ANSC 4270 - Fundamentals of Endocrinology 3
ANSC 4400 - Tools for a Lifelong Career in Research 1
ANSC 4510 - Dairy Herd Business Management 3
ANSC 4880 - Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainability 3-4

Spring Courses:

ANSC 1105 - Careers in Animal Science 1
ANSC 2210 - Principles of Animal Genetics 4
ANSC 2300 - Introduction to Domestic Mammalian Behavior 2
ANSC 2400 - Animal Reproduction and Development 3
ANSC 2410 - Animal Reproduction and Development Lab 1
ANSC 2500 - Dairy Cattle Principles 3
ANSC 2551 - Dairy Study Trip to Italy II *(offered in even-numbered years only)* 1
ANSC 3200 - Comparative Animal Nutrition and Toxicology: Horses, Dogs, Cats, and More 4
ANSC 3300 - Fish Physiology 3
ANSC 3310 - Applied Dairy Cattle Genetics *(offered in odd- numbered years only)* 2
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 3510 - Dairy Herd Management 4
ANSC 3511 - Junior Dairy Fellows 2
ANSC 3550 - Dairy Cattle Nutrition 3
ANSC 3561 - International Dairy Study Trip II *(offered in even- numbered years only)* 1
ANSC 3600 - Beef Cattle *(offered in even numbered years only)* 3
ANSC 3700 - Immunology in Animal Health and Disease 3
ANSC 3800 - Sheep *(offered in odd- numbered years only)* 3
ANSC 3920 - Mechanisms of Animal Growth and Development 2
(offered in odd- numbered years only)
ANSC 3980 - Animals in Biomedical Research *(offered in odd- numbered years only)* 2

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