



PennState

College of Agricultural Sciences
Department of Animal Science

ANIMAL SCIENCE

UNDERGRADUATE

STUDENT HANDBOOK

“For students enrolled Summer 2018 and later”

08/2021

Penn State Animal Science

Department of Animal Science

PENNSSTATE



College of Agricultural Sciences

ANIMAL SCIENCE MAJOR

<http://animalscience.psu.edu>

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University Park, PA 16802
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ANIMAL SCIENCE MAJOR

The Animal Science Major is a four-year program leading to the Bachelor of Science Degree. The primary objective of this program is to provide the opportunity for the student to develop expertise in many aspects of the animal industries, to develop skills in communication and quantification, and to obtain a broad understanding of the natural sciences, arts, humanities, social and behavioral sciences.

This major offers two options (business and animal management and science) so that students may select numerous areas of study to help them gain employment in the many and diverse career opportunities available in the Animal Sciences. Courses in both options can be selected by students to plan a program consistent with their personal interests and professional goals. Specific requirements of the major are listed in the Baccalaureate Degree Programs Bulletin (<http://www.psu.edu/academic/bluebook/>).

Students interested in domestic animal species have the opportunity to develop basic and applied knowledge in biological and physical sciences, nutrition, genetics, reproduction, physiology, economics, business management, animal products and much more. Additionally, there are opportunities to study the care and management of companion animals, horses, livestock, dairy and poultry. Current areas of faculty expertise include ruminant nutrition, genetics and genomics, and reproductive biology. Combining studies in related fields such as agribusiness management, wildlife and fisheries science, agronomy or biology is possible.

Students majoring in Animal Science have many opportunities for hands-on experience in animal facilities and laboratories, internships and other student employment related to the program, participation in teams and clubs, scholarships, and international study.

Employment opportunities available to graduates of the Animal Science Major include, but are not limited to, technical sales and service for companies supplying feed, equipment, pharmaceuticals and other related agriculture products; promotion, public relations and human resources, and editorial positions; finance and insurance; county extension and other government agencies; management trainee for agri-business industries; herdspersons, flock supervisors, returning to the family farm, assistant farm managers; breed associations and artificial insemination and embryo transfer firms; and livestock buyers, inspectors, supervisors and quality control personnel in the meats and poultry industries. Graduates also may pursue post-baccalaureate study in graduate school to prepare for careers in research, teaching, or extension. Others may pursue studies in veterinary medicine.

**ANIMAL SCIENCE MAJOR
SCIENCE OPTION
124 Total Credits Required**

FIRST SEMESTER	CREDITS	SECOND SEMESTER	CREDITS
ENGL 015 – Rhetoric & Comp (GWS) or ENGL 030 – Honors Fresh Comp (GWS)*3		AN SC 100	3
General Education	3	CHEM 112 - Chem Princ (GN)	3
CHEM 110 - Chem Princ (GN)	3	CHEM 113 - Exper Chem (GN)	1
CHEM 111 - Exper Chem (GN)	1	AG BM 101 – Econ Prin Agribus (GS) or ECON 102 – Micro Anly (GS)	3
First-Year Seminar (S)	1	Quantification selection (GQ)*	2-4 ^b
Quantification selection (GQ)*	<u>3-4^a</u>	General Education (GH)	<u>3</u>
	14-15		15-17
THIRD SEMESTER	CREDITS	FOURTH SEMESTER	CREDITS
BIOL 110 - Biology Conc Biod (GN)	4	▼ AN SC 201 *	4
▼ AN SC 290	1	AGRO 028 - Prin Crop Mgmt or SOILS 101 - Intro Soils or	
▼ AN SC 207*, 208*	3	▼ AN SC 213 (fall only) or AN SC 211	3
CHEM 202 or CHEM 210 Organic Chemistry	3	BIOL 220 – Biology Pop Comm or BIOL 230 – Biology Mol Cells or BIOL 240 – Biol Func Dev Org	4
General Education (GHW)	1.5	CHEM 203 or CHEM 212 and CHEM 213 Organic Chemistry (Lab)	3-5
General Education	<u>3</u>	General Education	<u>3</u>
	15.5		17-19
FIFTH SEMESTER	CREDITS	SIXTH SEMESTER	CREDITS
▼ AN SC 301*	3	▼ AN SC 300*	3
▼ AN SC 305*, 306*, 308*, 309*, 310*, 311*, 315*, 324* or 327*	3-4	B M B 221 - Applied Biochem	2
▼ AN SC 322 or BIOL 222-Genetics	3	General Education (GHW)	1.5
B M B 211 - Elem Biochemistry	3	MICRB 201 – Intro Microbiology	3
B M B 212 - Elem Biochem Lab	1	MICRB 202 – Intro Micro Lab	2
CAS 100*	<u>3</u>	PHYS 250 - Intro Phys (GN) ^d	<u>4</u>
	16-17		15.5
SEVENTH SEMESTER	CREDITS	EIGHTH SEMESTER	CREDITS
▼ AN SC 305*, 306*, 308*, 309*, 310*, 311*, 315*, 324*, 327*	3-4	▼ AN SC 423	3
▼ AN SC 431	4	Supporting courses	5-7 ^e
Elective	0-4 ^c	ANSC 202 W or Communication Skills selection	3-5 ^f
ENGL 202 selection (GWS)*	3 ^g	Elective	<u>1-3</u>
General Education	<u>3</u>		12-18
	13-18		

^a Required to complete one of the following: MATH 021 GQ(3), 022 GQ(3), 26 GQ(3), 41 GQ(4), 110 GQ(4), or 140 GQ(4); recommend MATH 110 GQ(4) or 140 GQ(4) for veterinary school admission. Check enforced pre-requisites for Math 110 and Math 140.

^b Required to complete one of the following: CMPSC 101 GQ(3), 203 GQ(4), MATH 022 GQ(3), 111 GQ(2), 141 GQ(4), 200 GQ(4), or 250 GQ(3).

^c PHYS 251 is required for admission to veterinary school.

^d Enforced Pre-requisites: ALEX score <= 76, or Math 22 + Math 26, or Math 40, or Math 41, or Math 26 and ALEX score <= 61.

^e Required to complete 5-7 credits from the department list. Courses that fulfill major requirements do not count in this area.

^f Required to complete one of the following: ENGL 50 (GA), 210, 212, 213, 215, any foreign language (001-003), SPAN 105 or 106; CAS 212, 213, 250, 352; AEE 330, 360, 440; ANSC 202W, AN SC 217 and 426, or AN SC 421 and 426, or AN SC 225 and 426, or AN SC 424 and 426. (AN SC courses cannot count as supporting courses and fulfill communication skills requirement)

^g Recommend ENGL 202C GWS, Technical Writing.

* A grade of C or higher is required to graduate.

▼ Course titles available on the semester schedule of Animal Science courses offered.

PROGRESS REPORT

MAJOR: ANIMAL SCIENCE **OPTION: SCIENCE** NAME: _____ STUDENT NUMBER: _____
 CREDITS REQUIRED: 124 ADVISOR: _____

REQUIREMENTS FOR THE MAJOR (91-102 CREDITS)																																																														
GENERAL EDUCATION REQUIREMENTS (45 CREDITS)	COMMON REQUIREMENTS FOR MAJOR (49-54 CREDITS)		REQUIREMENTS FOR OPTION (42-46 CREDITS)																																																											
<p>(18 to 24 of these are included in requirements for major)</p> <p>FIRST YEAR SEMINAR (1) (S)</p> <p>_____</p> <p>See General Education Requirements Worksheet or visit https://genedplan.psu.edu</p> <p>AGBM 101 (3) or ECON 102(3) fulfills 1 (GS) requirement</p> <p>GN requirements are usually fulfilled within required major courses</p> <p>ENGL 15, ENGL 202, and CAS 100 are C-required.</p> <p>Must include 3 credits of U.S. (US) and 3 credits of International (IL) Cultures</p> <p>US _____ IL _____</p> <p>ELECTIVES (0-14 CREDITS)</p> <p>_____</p> <p>_____</p>	<p>COMMON PRESCRIBED (24 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">CR</th> <th style="width: 10%; text-align: center;">GD</th> </tr> </thead> <tbody> <tr><td>AN SC 100</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>* AN SC 201</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> <tr><td>* AN SC 207 & 208</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>AN SC 290</td><td style="text-align: center;">1</td><td style="text-align: center;">_____</td></tr> <tr><td>* AN SC 300</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>* AN SC 301</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>BMB 211</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>BIOL 110 GN</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> </tbody> </table> <p>ADDITIONAL (21-25 CREDITS)</p> <p>CHEM 202 <i>or</i> 210 3 _____</p> <p>ANSC 322 <i>or</i> BIOL 222 3 _____</p> <p>AG BM 101 GS <i>or</i> ECON 102 GS 3 _____</p> <p>* AN SC 305, 306, 308, 309, 310 311, 315, 324, <i>or</i> 327 6-8 _____</p> <p>* MATH 021 GQ, 022 GQ, 26 GQ, 41 GQ, 110 GQ^a, <i>or</i> 140 GQ^a 3-4 _____</p> <p>* CMPSC 101 GQ, 203 GQ; MATH 022 GQ, 111 GQ, 141 GQ, 200 GQ, <i>or</i> 250 GQ 2-4 _____</p> <p>SUPPORTING COURSES AND RELATED AREAS: (3-5 CREDITS)</p> <p><i>Communication Skills</i>^e 3-5 _____</p> <p>* <i>A grade of C or higher must be obtained to graduate – Policy 82-44.</i></p> <p>** <i>Writing across the curriculum designation. Required to complete 3 credits within the College</i></p>			CR	GD	AN SC 100	3	_____	* AN SC 201	4	_____	* AN SC 207 & 208	3	_____	AN SC 290	1	_____	* AN SC 300	3	_____	* AN SC 301	3	_____	BMB 211	3	_____	BIOL 110 GN	4	_____	<p>SCIENCE OPTION PRESCRIBED (27 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">CR</th> <th style="width: 10%; text-align: center;">GD</th> </tr> </thead> <tbody> <tr><td>AN SC 423</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>AN SC 431</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> <tr><td>BMB 212</td><td style="text-align: center;">1</td><td style="text-align: center;">_____</td></tr> <tr><td>BMB 221</td><td style="text-align: center;">2</td><td style="text-align: center;">_____</td></tr> <tr><td>CHEM 110 & 111 GN</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> <tr><td>CHEM 112 & 113 GN</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> <tr><td>MICRB 201</td><td style="text-align: center;">3</td><td style="text-align: center;">_____</td></tr> <tr><td>MICRB 202</td><td style="text-align: center;">2</td><td style="text-align: center;">_____</td></tr> <tr><td>PHYS 250 GN^a</td><td style="text-align: center;">4</td><td style="text-align: center;">_____</td></tr> </tbody> </table> <p>ADDITIONAL (16-19 CREDITS)</p> <p>CHEM 203 or 212 & 213 3-5 _____</p> <p>AGRO 028, SOILS 101 <i>or</i> AN SC 213 or AN SC 211 3 _____</p> <p>BIOL 220, 230, <i>or</i> 240 4 _____</p> <p>SUPPORTING COURSES AND RELATED AREAS (5-7 CREDITS 400 level) ***</p> <p>Select 5-7 credits from the department list. 5-7 _____</p> <p><i>*** Courses that fulfill major requirements do not count in this area.</i></p> <p>NOTE: 296 or 496(TA, research, etc.) credit may not be used to fulfill any degree requirements.</p> <p>^a Pre-requisites rigidly enforced.</p>				CR	GD	AN SC 423	3	_____	AN SC 431	4	_____	BMB 212	1	_____	BMB 221	2	_____	CHEM 110 & 111 GN	4	_____	CHEM 112 & 113 GN	4	_____	MICRB 201	3	_____	MICRB 202	2	_____	PHYS 250 GN ^a	4	_____
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Animal Science Major Science Option Supporting Courses

Select 5-7 additional credits from the following list. Courses that fulfill major requirements or the additional production course for the option cannot count as a supporting course. 496 credits may not be substituted for this requirement.

Science Selections:

Course (credits)	Title	Semester Offered
AN SC 410 (4)	Advanced Dairy Herd Management	Fall
AN SC 413 (3)	Transgenic Biology	Spring
AN SC 415 (3)	Companion Animal Behavior	Spring
AN SC 418 (3)	Nutrient Management in Agricultural Systems	Fall
AN SC 419W (3)	Applied Animal Welfare	Fall
AN SC 420 (4)	Animal Nutrition and Feed Technology	Spring
ANSC 422W (3)	Dairy Cattle Evaluation and Selection	Spring
AN SC 425 (3)	Principles of Avian Diseases	Fall
AN SC 427 (3)	Milk Secretion	Spring
AN SC 432 (1)	Techniques in Cattle Reproduction	Fall
AN SC 447 (GN) (3)	Equine Exercise Physiology	Fall
AN SC 457 (3)	Equine Reproduction and Breeding Farm Management	Fall
AN SC 467W (3)	Equine Nutrition and Feeding	Spring
BIOL 479 (3)	General Endocrinology	Fall (odd years)
FD SC 408 (2)	Food Microbiology	Fall
FD SC 409W (3)	Laboratory in Food Microbiology	Fall
FD SC 415 (3)	Science and Technology of Muscle Foods	Spring
VB SC 402W (3)	Biology of Animal Parasites	Spring
VB SC 403 (3)	Principles of Animal Disease	Fall
VB SC 405 (3)	Laboratory Animal Science	Spring
VB SC 420 (3)	General Animal Pathology	Fall
VB SC 421 (3)	Comparative Anatomy of Vertebrates	Fall
VB SC 423W (3)	Pathology of Nutritional and Metabolic Diseases	Spring
WFS 407 (3)	Ornithology	Spring
WFS 408 (3)	Mammalogy	Spring
WFS 430 (3)	Conservation Biology	Fall
WFS 447W (3)	Wildlife Management	Fall
WFS 460 (3)	Wildlife Behavior	Fall

ANIMAL SCIENCE MAJOR
BUSINESS and ANIMAL MANAGEMENT OPTION
124 Total Credits Required

FIRST SEMESTER	CREDITS	SECOND SEMESTER	CREDITS
BIOL 110 – Biology Conc Biod (GN)	4	▼ AN SC 100	3
ENGL 015 – Rhetoric and Comp (GWS) or ENGL 030 - Honors Fresh Comp (GWS)*3		AG BM 101 – Econ Prin Agribus (GS) or ECON 102 – Microec Anly (GS)	3
General Education	3	CHEM 101(GN), 110 ^c (GN), 130(GN)	3
First Year Seminar (S)	1	General Education	3
Quantification selection (GQ)*	<u>3-4^a</u>	Quantification selection (GQ)*	<u>2-4^b</u>
	14-15		14-16

THIRD SEMESTER	CREDITS	FOURTH SEMESTER	CREDITS
▼ AN SC 290	1	▼ AN SC 201*	4
▼ AN SC 207* and 208*	3	ACCTG 211 – Fin Mgl Acc Dec Mk	4
MICRB 106 – Elem Micrb (GN) or MICRB 201 – Intro Microbiology	3	AG BM 200 – Introduction to Agribus Mgmt or BA 304 Mgmt and Organization ^d	3
MICRB 107 – Elem Micrb Lab (GN) or MICRB 202 – Intro Micrb Lab	1-2	General Education	3
AG BM 102 – Econ Food System or BA 303 – Marketing ^d	3	ANSC 202 W or Communication Skills Selection ^g	<u>3</u>
CHEM 202 – Organic Chem	3		17
General Education	<u>1.5</u>		
	15.5-16.5		

FIFTH SEMESTER	CREDITS	SIXTH SEMESTER	CREDITS
▼ AN SC 301*	3	▼ AN SC 305*, 306*, 308*, 309*, 310*, 311*, 315*, 324*, 327*	3-4
▼ AN SC 305*, 306*, 308*, 309*, 310*, 311*, 315*, 324*, 327*	3-4	▼ AN SC 300*	3
▼ AN SC 322 or BIOL 222	3	CAS 100 – Effective Speech (GWS)*	3
General Education	3	Supporting Courses	<u>6^e</u>
BMB 211 – Elem Biochem	<u>3</u>		15-16
	15-16		

SEVENTH SEMESTER	CREDITS	EIGHTH SEMESTER	CREDITS
▼ AN SC 420, 423, 427, 431	3-4	Supporting Courses	11 ^e
General Education	3	General Education (GHW)	1.5
Supporting Courses	6 ^e	Elective	<u>0-3</u>
ENGL 202D*	3 ^f		12.5-15.5
Elective	<u>1-3</u>		
	16-19		

^a Required to complete one of the following: MATH 021 GQ(3), 022 GQ(3), 26 GQ (3), 41 GQ (4), 110 GQ(4), or 140 GQ(4). Check enforced pre-requisites for Math 110 and Math 140.

^b Required to complete one of the following: CMPSC 101 GQ(3), 203 GQ(4), MATH 022 GQ(3), 111 GQ(2), 141 GQ(4), STAT 100 GQ(3), 200 GQ(4), or 250 GQ(3).

^c To receive Natural Sciences General Education (GN) credit for CHEM 110, CHEM 111 must be taken in addition to CHEM 110

^d Econ 102 pre-requisite

^e Required to complete 23 credits from the department list (at least 9 credits of business and 9 credits of production courses; 12 credits must be 400 - level courses). These 23 credits cannot fulfill any other requirements.

^f Recommend ENGL 202D GWS, Business Writing.

^g Required to complete one of the following: ENGL 50 (GA), 210, 212, 213, 215; any foreign language (001-003), SPAN 105 or 106, CAS 212, 213, 250, 352; AEE 330, 360, 440; ANSC 202W, AN SC 217 and 426, or AN SC 421 and 426, or AN SC 225 and 426, or AN SC 424 and 426 (AN SC courses cannot count as supporting courses and fulfill communication skills requirement).

* A grade of C or higher is required to graduate credits - Senate Policy 82 - 44.

▼ Course titles available on the semester schedule of Animal Science courses offered.

PROGRESS REPORT

MAJOR: ANIMAL SCIENCE OPTION: BUSINESS and ANIMAL MANAGEMENT

NAME: _____

STUDENT NUMBER: _____

CREDITS REQUIRED: 124

ADVISOR: _____

REQUIREMENTS FOR THE MAJOR (91-102 CREDITS)

GENERAL EDUCATION REQUIREMENTS (45 CREDITS)	COMMON REQUIREMENTS FOR MAJOR (49-54 CREDITS)	REQUIREMENTS FOR OPTION (42-48 CREDITS)																																																																																																			
<p>(18 to 24 of these are included in requirements for major)</p> <p>FIRST YEAR SEMINAR (1) (S)</p> <p>_____</p> <p>See General Education Requirements Worksheet Or visit https://gendplan.psu.edu</p> <p>AGBM 101(3) or ECON 102 (3) fulfills 1 (GS) requirement</p> <p>GN requirements are usually fulfilled within required major courses</p> <p>ENGL 15, ENGL 202, and CAS 100 are C-required.</p> <p>Must include 3 credits of U.S. (US) and 3 credits of International (IL) Cultures</p> <p>US _____ IL _____</p> <p>ELECTIVES (0-14 CREDITS)</p> <p>_____</p> <p>_____</p>	<p>COMMON PRESCRIBED (24 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">CR</th> <th style="text-align: center;">GD</th> </tr> </thead> <tbody> <tr> <td>AN SC 100</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* AN SC 201</td> <td style="text-align: center;">4</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* AN SC 207 & 208</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AN SC 290</td> <td style="text-align: center;">1</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* AN SC 300</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* AN SC 301</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>BMB 211</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>BIOL 110 GN</td> <td style="text-align: center;">4</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table> <p>ADDITIONAL (21-25 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>CHEM 202 or 210</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AN SC 322 or BIOL 222</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AG BM 101 GS <i>or</i> ECON 102 GS</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* AN SC 305, 306, 308, 309, 310, 311, 315, 324, <i>or</i> 327</td> <td style="text-align: center;">6-8</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* MATH 021 GQ, 022 GQ, 26 GQ, 41 GQ, 110 GQ^a <i>or</i> 140 GQ^a</td> <td style="text-align: center;">3-4</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>* CMPSC 101 GQ, 203 GQ; MATH 022 GQ, 111 GQ, 141 GQ; 200 GQ, <i>or</i> 250 GQ</td> <td style="text-align: center;">2-4</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table> <p>SUPPORTING COURSES AND RELATED AREAS: (3-5 CREDITS)</p> <p><i>Communication Skills</i>[§] 3-5 _____</p> <p>* <i>A grade of C or higher must be obtained to graduate – Policy 82-44.</i></p> <p>** <i>Writing across the curriculum designation. Required to complete 3 credits within the College</i></p> <p>*** <i>These 23 credits cannot fulfill any other requirements.</i></p>		CR	GD	AN SC 100	3	_____	* AN SC 201	4	_____	* AN SC 207 & 208	3	_____	AN SC 290	1	_____	* AN SC 300	3	_____	* AN SC 301	3	_____	BMB 211	3	_____	BIOL 110 GN	4	_____	CHEM 202 or 210	3	_____	AN SC 322 or BIOL 222	3	_____	AG BM 101 GS <i>or</i> ECON 102 GS	3	_____	* AN SC 305, 306, 308, 309, 310, 311, 315, 324, <i>or</i> 327	6-8	_____	* MATH 021 GQ, 022 GQ, 26 GQ, 41 GQ, 110 GQ ^a <i>or</i> 140 GQ ^a	3-4	_____	* CMPSC 101 GQ, 203 GQ; MATH 022 GQ, 111 GQ, 141 GQ; 200 GQ, <i>or</i> 250 GQ	2-4	_____	<p>BUS/ANI/MGT OPTION PRESCRIBED (4 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">CR</th> <th style="text-align: center;">GD</th> </tr> </thead> <tbody> <tr> <td>ACCT 211</td> <td style="text-align: center;">4</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>OR</td> <td></td> <td></td> </tr> <tr> <td>ANSC 346</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table> <p>ADDITIONAL (19-22 CREDITS)</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>CHEM 130 GN or CHEM 110</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AG BM 102 <i>or</i> BA 303</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AG BM 200 <i>or</i> BA 304</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>AN SC 420, 423, 427, 431</td> <td style="text-align: center;">3-4</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>MICRB 106 GN <i>or</i> 201</td> <td style="text-align: center;">3</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>MICRB 107 GN <i>or</i> 202</td> <td style="text-align: center;">1-2</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table> <p>SUPPORTING COURSES AND RELATED AREAS (23 CREDITS) ***</p> <p>Select 23 credits from the Department list. At least 9 credits in business and 9 credits in production courses and at least 12 credits must be at the 400-level.**</p> <p>Business Selections:</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table> <p>Production Selections:</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table> <p>Additional Selections:</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table> <p>NOTE: 296 or 496(TA, research, etc.) credit may not be used to fulfill any degree requirements.</p> <p>^a Pre-requisites rigidly enforced.</p>		CR	GD	ACCT 211	4	_____	OR			ANSC 346	3	_____	CHEM 130 GN or CHEM 110	3	_____	AG BM 102 <i>or</i> BA 303	3	_____	AG BM 200 <i>or</i> BA 304	3	_____	AN SC 420, 423, 427, 431	3-4	_____	MICRB 106 GN <i>or</i> 201	3	_____	MICRB 107 GN <i>or</i> 202	1-2	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Animal Science Major

Business and Animal Management Option Supporting Courses

Select 23 additional credits from the following list. At least 9 credits of business and 9 credits of production courses (Courses that fulfill major requirements or the additional production course for the option cannot count as a supporting course.); 12 of the 23 credits must be 400-level courses. Courses required in the major cannot be counted to meet these 12 credits of 400-level courses. 496 credits may not be substituted for this substituted for this requirement.

Business Selections:

Course (credits)	Title	Semester Offered
AG BM 106 (3)	Agribusiness Problem Solving	Fall, Spring
AN SC 117 (2)	Equine Marketing	Spring
AG BM 302 (3) ^d	Food Product Marketing	Fall, Spring
AG BM 308 (3) ^b	Strategic Decision Making in Agribusiness	Fall, Spring
AG BM 320 (3) ^d	Market and Prices	Fall, Spring
AG BM 338 (3)	Global Agribusiness	Fall, Spring
AG BM 407 (3)	Farm Planning and Financial Management	Fall, Spring
AG BM 408 (3)	Financial Decision Making for Agribusiness	Spring
AG BM 420 (3)	Agribusiness Markets and Prices	Fall, Spring
AG BM 460 (3) ^d	Managing the Food System	Fall
AN SC 450 (3)	Dairy Farm Management Systems	Spring
BA 301 (3) ^c	Finance	Fall, Spring
BA 302 (3) ^c	Supply Chains	Fall, Spring
BA 303 (3)	Marketing	Fall, Spring
BA 304 (3)	Management and Organization	Fall, Spring
B LAW 243 (3)	Legal Environment of Business	Fall, Spring
ENGR 310	Entrepreneurial Leadership	Fall, Spring
ENGR 411 ^a	Entrepreneurial Business Basics	Fall, Spring
IB 303 (IL) (3)	International Business Operations	Fall, Spring
IST 110 (GS) (3)	Introduction to Information Sciences and Technology	Fall, Spring
LER 100 (GS) (3)	Employment Relations	Fall, Spring
SCM 200 (4)	Introduction to Statistics for Business	Fall, Spring

^a Students must be enrolled in the entrepreneurship minor in order to schedule these courses.

^b Writing Across the Curriculum designation. Required to complete 3 credits within the College.

^c May be used to fulfill Smeal College Business Fundamentals Certificate if taken in addition to: BA 303, BA 304, Acctg 211, Econ 102 and a 200 level statistics.

^d Students must be enrolled in the AGBM minor.

Production Selections:

Course (credits)	Title	Semester Offered
AGRO 028 (3)	Principles of Crop Management	Fall
AGRO 423 (3)	Forage Crop Management	Fall
AGRO 425 (3)	Field Crop Management	Spring
AN SC 107 (3)	Intro to Equine Science and Industry	Fall, Spring
AN SC 211 (3)	Introduction to Avian Biology	Spring
AN SC 213 (3)	Introduction to Animal Biotechnology	Fall
AN SC 215 (GS) (3)	Pets in Society	Summer, Fall, Spring
AN SC 217 (2)	Introduction to Horse Judging	Fall, Spring
AN SC 225 (1)	Introduction to Dairy Judging	Spring
AN SC 226 (2)	Meat Selection and Grading	Spring
AN SC 305 (3)	Companion Animal Nutrition and Management	Fall
AN SC 306 (3)	Swine Production and Management	Fall
AN SC 308 (3)	Sheep and Goat Production and Management	Spring (even years)
AN SC 309 (4)	Beef Cattle Production and Management	Spring
AN SC 310 (3)	Dairy Cattle Production and Management	Spring
AN SC 311 (3)	Poultry Production and Management	Fall
AN SC 315 (3)	Small Animal Health	Spring
AN SC 317 (3)	Horse Handling and Training	Spring
AN SC 324 (3)	Value Determination of Meat Animals	Fall
AN SC 327 (4)	Horse Production and Management	Fall
AN SC 332N (3)	Science and Policy of Global Greenhouse Gas Emissions and Mgmt	Fall
AN SC 350 (2)	Dairy Problem Solving	Spring
AN SC 410 (4)	Advanced Dairy Herd Management	Fall
AN SC 413 (3)	Transgenic Biology	Spring
AN SC 415 (3)	Companion Animal Behavior	Spring
AN SC (AGECO) (SOILS) 418 (3)	Nutrient Management in Agricultural Systems	Fall
AN SC 419 (3)**	Applied Animal Welfare	Fall
AN SC 420 (4)	Animal Nutrition and Feed Technology	Spring
AN SC 421 (3)*	Poultry Evaluation and Selection	Spring
AN SC 422 (3)**	Dairy Cattle Evaluation and Selection	Spring
AN SC 423 (3)	Comparative Physiology of Domestic Animals	Spring
AN SC 424 (3)*	Livestock Breeding Evaluation and Selection	Spring
AN SC (VB SC) 425 (3)	Principles of Avian Diseases	Fall
AN SC 426 (2)*	Advanced Judging and Selection	Fall
AN SC 427 (3)	Milk Secretion	Spring
AN SC 429 (3)	Advanced Beef Cattle Production	Fall
AN SC 431 (4)	Physiology of Mammalian Reproduction	Fall
AN SC 432 (1)	Techniques in Cattle Reproduction	Fall
AN SC 437 (3)	Equine Facilitated Therapy	Fall (even years)
AN SC 447 (GN) (3)	Equine Exercise Physiology	Fall
AN SC 450 (3)	Dairy Farm Management Systems	Spring
AN SC 451 (1-2)	Dairy Systems Analysis	Fall, Spring
AN SC 457 (3)	Equine Reproduction and Breeding Farm Management	Fall
AN SC 467 (3)**	Equine Nutrition and Feeding	Spring
FD SC 200 (3)	Introductory Food Science	Fall
FD SC 408 (2)	Applied Food Microbiology	Fall
FD SC 409 (3)**	Laboratory in Applied Food Microbiology	Fall
FD SC 415 (3)	Science and Technology of Muscle Foods	Spring
SOILS 101 (GN) (3)	Introduction to Soils	Fall, Spring
VB SC 403 (3)	Principles of Animal Disease	Fall
VB SC 402 (ENT) (3)**	Biology of Animal Parasites	Spring
VB SC 405 (3)	Laboratory Animal Science	Spring
VB SC 407 (2)	Dairy Herd Health Programs	Spring
VB SC 420 (3)	General Animal Pathology	Fall
VB SC 423 (3)**	Pathology of Nutritional and Metabolic Diseases	Fall
WFS 407 (3)	Ornithology	Spring
WFS 408 (3)	Mammalogy	Spring
WFS 430 (3)	Wildlife Biology	Fall
WFS 447(3)**	Wildlife Management	Fall
WFS 460 (3)	Wildlife Behavior	Fall

*Cannot count as supporting production courses and fulfill communication skills requirement.

**Writing Across the Curriculum. Required to complete 3 credits within the College.

Penn State Animal Science Contacts

Department of Animal Science

PENNSSTATE



College of Agricultural Sciences

ADVISERS

<u>Name</u>	<u>Address</u>	<u>Telephone(814)</u>	<u>Email Address</u>	<u>Interest Area</u>
Paul Bartell	301A FRL	863-2101	pab43@psu.edu	Avian Biology
John Boney	318 Ag Sc In	863-8934	jxb2002@psu.edu	Poultry
Phillip Clauer	319 Ag Sc In	863-8960	plclauer@psu.edu	Poultry
Rachel Cloninger**	346 Ag Sc In	863-4198	rle5000@psu.edu	Animal Science
Chad Dechow	Almquist Res. Cen.	863-3659	cdd1@psu.edu	Dairy, Genetics
Francisco Diaz	313 FRL	865-1499	fjd10@psu.edu	Reproductive Biology
Nancy Dreschel	312 Ag Sc In	863-4197	ndreschel@psu.edu	Small Animals/Behavior
Brian Egan	348 Ag Sc In	863-0569	began@psu.edu	Horses
Robert Elkin	323 Ag Sc In	863-2102	rge3@psu.edu	Nutritional Biochemistry
Tara Felix	351 Ag Sc In	865-0065	tfelix@psu.edu	Beef Nutrition
Kevin Harvatine	321 Ag Sc In	865-6334	kjh182@psu.edu	Nutritional Physiology
Elizabeth Hines	315 Ag Sc In	865-3267	eah405@psu.edu	Swine
Lisa Holden	339 Ag Sc In	863-3672	lholden@psu.edu	Dairy
Alexander Hristov	352 Ag Sc In	863-3669	anh13@psu.edu	Dairy Nutrition
Virginia Ishler	343 Ag Sc In	863-3912	vail@psu.edu	Dairy
Dan Kniffen	320 Ag Sc In	865-7809	dkniffen@psu.edu	Beef Cattle
Andrea Kocher	314 Ag Sc In	863-3957	alg917@psu.edu	Horses
Ann Macrina	332 Ag Sc In	863-4202	alm106@psu.edu	Horses, Lactation
Gino Lorenzoni	306 Ag Sc In	863-7302	agl20@psu.edu	Poultry
Wansheng Liu	310 FRL	867-1673	wul12@psu.edu	Genomics

Robert Mikesell*	345 Ag Sc In	865-2987	rem9@psu.edu	Beef and Swine
Edward Mills	350 Ag Sc In	865-2394	emills@psu.edu	Muscle Foods
Dale Olver	349 Ag Sc In	863-3914	dro105@psu.edu	Dairy
Troy Ott	319 FRL	441-2657	tlo12@psu.edu	Reproductive Biology
Joy Pate	320 FRL	863-0558	jpate@psu.edu	Reproductive Biology
Ramesh Ramachandran	301B FRL	865-5202	RameshR@psu.edu	Molecular Neuroendocrinology
Danielle Smarsh	315 Ag Sc In	865-7810	dxs1172@psu.edu	Horses
Burt Staniar	316 Ag Sc In	865-0698	wbs14@psu.edu	Horses
Jacob Werner	101 Central Bio Lab	865-1495	jrw140@psu.edu	Veterinary Medicine
Ben Williamson	307 Ag Sc In	867-4917	bcw13@psu.edu	Livestock

*Animal Science Program Coordinator

**Animal Science Advising Coordinator

Administrative Support Assistants

Molly Martin	335B Ag Sc In	863-3664	mjf217@psu.edu
Cathy Walker	335B Ag Sc In	865-7638	cjw26@psu.edu

Animal Science Minor Department of Animal Science

The Animal Science minor is designed for students who wish to supplement their academic major with studies in animal science.

Requirements

Students are required to complete a minimum of 20 credits, at least six of which must be at the 400 level. A grade of C or better must be obtained in each course in order to complete the minor. The core of prescribed courses develops a foundation in the various basic disciplines of animal science. Additional courses may be selected by the student to emphasize the production/management of beef cattle, companion animals, dairy cattle, horses, poultry, sheep, or swine, or to emphasize genetics, nutrition or physiology.

Prescribed courses:

AN SC 201(4):	Animal Science
AN SC 290(1):	Careers in Animal Agriculture
AN SC 207(2):	(FD SC) Animal Products Technology AND
AN SC 208(1):	(FD SC) Animal Products Technology Lab OR
AN SC 300(GN)(3):	Integrated Animal Biology
AN SC 301(3):	Principles of Animal Nutrition

Additional Courses:

The student must select 3 credits from the following list:

AN SC 305(3):	Companion Animal Nutrition
AN SC 306(3):	Swine Production and Management
AN SC 308(3):	Sheep and Goat Production and Mgmt.
AN SC 309(4):	Beef Cattle Production and Management
AN SC 310(3):	Dairy Cattle Production and Mgmt.
AN SC 311(4):	Poultry Production and Management
AN SC 327(4):	Horse Production and Management

The student must select, in consultation with the Undergraduate Program Coordinator, at least 6 credits at the 400 level from the following list:

AN SC 410(4):	Advanced Dairy Herd Management
AN SC 413(3):	Transgenic Biology
AN SC 415(3):	Companion Animal Behavior
AN SC 418(3):	Nutrient Management in Agricultural Systems
AN SC 419W(3):	Applied Animal Welfare
AN SC 420(4):	Animal Nutrition and Feed Technology
AN SC 421(3):	Poultry Evaluation and Selection
AN SC 422W(3):	Dairy Cattle Evaluation and Selection
AN SC 423(3):	Comparative Physiology of Domestic Animals
AN SC 424(3):	Livestock Breeding Evaluation and Selection
AN SC 425(3):	(VB SC) Principles of Avian Diseases
AN SC 426(2):	Advanced Judging and Selection
AN SC 427(3):	Milk Secretion
AN SC 429(3):	Advanced Beef Cattle Production
AN SC 431(4):	Physiology of Mammalian Reproduction
AN SC 432(1):	Techniques in Cattle Reproduction
AN SC 437(3):	Equine Facilitated Therapy
AN SC 450(3):	Dairy Farm Management Systems
AN SC 447(3):	Equine Exercise Physiology
AN SC 457(3):	Equine Reprod. and Breeding Farm Mgmt.
AN SC 467W(3):	Equine Nutrition and Feeding

Procedures for Enrollment

Students enroll in the minor via LionPATH after they have completed 60 or more credits. For additional information contact the Undergraduate Program Coordinator, Dr. Robert E. Mikesell, 345 Ag Sc In Building, University Park, PA 16802, phone (814) 865-2987. Email address: rem9@psu.edu.



Equine Science Minor

Department of Animal Science

The Equine Science Minor is designed for students who wish to supplement their academic major with studies in equine science.

Requirements

Students are required to complete a minimum of 21 credits, at least 6 of which must be at the 400 level. A grade of C or better must be obtained in each course in order to complete the minor. The core of prescribed courses develops a foundation in the basic discipline of animal science and equine science. Additional courses may be selected by the student to emphasize other special areas of interest.

Prescribed Courses: (all must be taken)

AN SC 107(3)	FA/SP	Introduction to Equine Science and Industry
AN SC 201(4)	FA/SP	Animal Science
AN SC 217(2)	FA/SP	Introduction to Horse Judging
AN SC 327(4)	FA	Horse Production and Management

Additional Courses: (take 3 credits)

ANSC 437(3)	FA*	Equine Facilitated Therapy
ANSC 447(3)	FA	Equine Exercise Physiology
ANSC 457(3)	FA	Equine Reproduction and Breeding Farm Management
ANSC 467(3)**	SP	Equine Nutrition and Feeding

Additional Courses: (take 6-7 credits of which 3 or more must be at the 400 level)

Cannot be used elsewhere in minor

AN SC 117 (2)	SP	Equine Marketing
ANSC 317(3)	SP	Horse Handling and Training
ANSC 415(3)	SP	Companion Animal Behavior
ANSC 418(3)	FA	Nutrient Management in Agricultural Systems
ANSC 419(3)**	FA	Applied Animal Welfare
ANSC 420(4)	SP	Animal Nutrition and Feed Technology
ANSC 423(3)	SP	Comparative Physiology of Domestic Animals
ANSC 427(3)	SP	Milk Secretion
ANSC 431(4)	FA	Physiology of Animal Reproduction
ANSC 437(3)	FA*	Equine Facilitated Therapy
ANSC 447(3)	FA	Equine Exercise Physiology
AN SC 457(3)	FA	Equine Reproduction and Breeding Farm Management
AN SC 467(3)**	SP	Equine Nutrition and Feeding
AGRO 423(3)	FA	Forage Crop Management
VBSC 403(3)	FA	Principles of Animal Disease

*offered in even numbered years

**Writing Across the Curriculum designation

Procedure for Enrollment

Students enroll in the minor in LionPATH after completing at least 27.1 credits or after being accepted into a major. For additional information, please contact the Program Coordinator, Ann Macrina, 322 Ag Sc In Building, University Park, PA 16802, (814) 863-4202, alm106@psu.edu.



Preparing for an Equine Science Minor

Once you have completed 27.1 credits or have entered a major, you are eligible to enroll in the Equine Science minor. This information is intended to answer your questions related to things to do and courses you might take while you are waiting to get to this point. Remember, as you proceed, that you must achieve a minimum grade of a C for all courses in the minor.

<u>Semester</u>	<u>Courses to take/things to do</u>
1	<p>Courses to take:</p> <ul style="list-style-type: none">• AN SC 107 (FA/SP) <p>Things to do:</p> <ul style="list-style-type: none">• Email Ann Macrina (alm106@psu.edu) and ask to be added to the Canvas Equine Minor Group as a pre-minor• Consider finding a club or activity you enjoy. Equine-related choices include<ul style="list-style-type: none">○ Block & Bridle Equine Committee○ Collegiate Horsemen's Association at Penn State○ Penn State Equine Research Team○ Penn State Equestrian Team○ Penn State Dressage Team○ Penn State Western Team
2	<p>Courses to take:</p> <ul style="list-style-type: none">• AN SC 217 (FA/SP)• AN SC 117 (SP) <p>Things to do:</p> <ul style="list-style-type: none">• Continue your club/activity• Check the Canvas site for possible internships or summer job ideas, but also look on your own
3 or 4	<p>Courses to take:</p> <ul style="list-style-type: none">• AN SC 201 (FA/SP) – pre-requisite for AN SC 327 <p>Things to do:</p> <ul style="list-style-type: none">• Become a committee chair or officer in your club/activity
4	<p>Courses to take:</p> <ul style="list-style-type: none">• Catch up on any courses not previously taken

POULTRY AND AVIAN SCIENCE MINOR

Department of Animal Science
College of Agricultural Sciences

The Poultry and Avian Science (P A S) Minor is designed for students who wish to supplement their academic major with studies focused on the biology and management of avian species, with an emphasis on domestic fowl. In recognition of the diverse career opportunities in the modern poultry and game bird industries, the minor is designed to also accommodate students with primary interests in agribusiness management, food science, and wildlife science. The University's Poultry Education and Research Center is used extensively for supplementing classroom work with hands-on laboratories. The flexibility of the minor permits program planning commensurate with an individual's interests and professional goals and should enhance the student's ability to compete for related positions in industry, government, and academia (graduate or professional school).

REQUIREMENTS

Students are required to complete a minimum of 19 credits (9 at the 400 level). The three prescribed courses provide a foundation of knowledge pertaining to both avian sciences and the commercial poultry industry, while additional courses selected by the student will allow for further specialization in the foundation animal science disciplines, agribusiness management, food science, and wildlife and fisheries science. In addition, credits from poultry or avian internship experiences and/or independent study projects may also be applied towards meeting the requirements of the minor. A grade of C or better is required for all courses in the minor.

PRESCRIBED COURSES (10 CREDITS)

- AN SC 211(3): Introduction to Avian Biology
(Sem: 1-4)
- AN SC 311(4): Poultry Production and Management
(Sem: 5-7)
- AN SC 425(3): Principles of Avian Diseases
(Sem: 6-8)

***ADDITIONAL COURSES (9 CREDITS)**

The student must select 3 credits from the following:

- AG BM 302(3): Food Product Marketing
- AG BM 338(3): Agribusiness in the Global Economy
- AN SC 207(2): Animal Products Technology
- AN SC 208(1): Animal Products Technology Laboratory
- AN SC 300(3): Integrated Animal Biology
- AN SC 301(3): Principles of Animal Nutrition
- AN SC 322 (3): Animal Genetics and Selection
- *AN SC 395(1-3): Animal Science Internship
- W F S 300(2): The Vertebrates
- W F S 301(2): Vertebrate Laboratory

The student must select 6 credits from the following:

- AG BM 407(3): Farm Planning and Financial Management
- AG BM 408(3): Financial Decision Making for Agribusiness
- AG BM 420(3): Agribusiness Markets and Prices
- AG BM 460(3): Managing the Food System
- AN SC 418(3): Nutrient Management in Agricultural Systems
- AN SC 420(4): Animal Nutrition and Feed Technology
- AN SC 421(3): Poultry Evaluation and Selection
- AN SC 423(3): Comparative Physiology of Domestic Animals
- *AN SC 496(3): Independent Studies
- FD SC 408(2): Food Microbiology
- FD SC 409W(3): Laboratory in Food Microbiology
- FD SC 411(2): Managing Food Quality
- FD SC 415(3): Science and Technology of Muscle Foods
- VB SC 420(3): General Animal Pathology
- WFS 406(1): Ornithology Laboratory
- WFS 407(3): Ornithology
- WFS 447W(3): Wildlife Management

*AN SC 395 and AN SC 496 must have a poultry or avian biology emphasis

PROCEDURES FOR ENROLLMENT

Students can enroll via LionPATH any time after they have achieved at least fifth semester classification, but not later than the end of the sixth week of the student's final semester. Contact Dr. [Robert G. Elkin](mailto:rge3@psu.edu) (rge3@psu.edu) to further discuss requirements for the minor.

Penn State Animal Science Courses

Department of Animal Science

PENNSSTATE



College of Agricultural Sciences

ANIMAL SCIENCE COURSE DESCRIPTIONS

Animal Science 100

INTRODUCTION TO ANIMAL INDUSTRIES (3). Students will study the biology, production systems, terminology, and emerging issues of the N. American animal industries. Instructor: R. Mikesell

Animal Science 107

INTRODUCTION TO EQUINE SCIENCE AND INDUSTRY (3). Prepare students to proceed into further studies in equine science by providing background to communicate effectively with educators and industry. Instructors: W. B. Staniar & A. Kocher.

Animal Science 117

EQUINE MARKETING (2). Principles of marketing and event planning including marketing systems, advertising, management systems, team building and other aspects of conducting a purebred livestock sale. Students learn through the planning and conducting of the annual Penn State Equine Science Showcase and Registered Quarter Horse Sale. Instructor: B. Egan.

Animal Science 150S

ANIMAL SCIENCE FRESHMEN SEMINAR (2). Students will engage in college success strategies including time management, advising resources, University practices, policies and procedures, as well as campus resources and opportunities. Students will explore Penn State's animal facilities and interact with peers and faculty while building research, oral, and written communication skills. Instructors: R. Cloninger, R. Mikesell, D. Olver, and D. Smarsh.

Animal Science 201

ANIMAL SCIENCE (4). Scope of animal and poultry science; genetic, physiological, nutritional, and health factors in food production. Instructor: D. Olver.

Animal Science 202W

CONTEMPORARY ISSUES IN ANIMAL AGRICULTURE (3). This course will be designed to give students focused on animal science and agriculture the necessary skill set to not only identify issues within the discipline but to source, cite, and write about those issues in the field of study as well. The course will emphasize the discussion and written work of contemporary or emerging issues in animal agriculture. It will involve self, peer, and instructor evaluations of writing over the course of the semester. Instructors: W.B. Staniar, T. Felix, E. Hines, & J. Boney.

Animal Science 207

AN SC 207 (FD SC 207) ANIMAL PRODUCTS TECHNOLOGY (2). Composition, safety, palatability, preservation, and processing of foods from animals, impact of animal production, and handling practices on product properties. Instructor: E. W. Mills.

Animal Science 208

AN SC 208 (FD SC 208) ANIMAL PRODUCTS TECHNOLOGY LABORATORY (1). Harvesting and processing of foods from animals; hands-on and demonstration exercises; industry procedures for processing meat, milk, and egg products. Prerequisite or concurrent: AN SC 207. Instructor: E. W. Mills.

Animal Science 211

INTRODUCTION TO AVIAN BIOLOGY (3). Introduces the biology of birds; lectures, laboratories on anatomy and function, incubation, breeding, disease control, management techniques and student projects. Prerequisite or concurrent: BIOL 110. Instructor: P. A. Bartell.

Animal Science 213

INTRODUCTION TO ANIMAL BIOTECHNOLOGY (3). An introduction to the multidisciplinary area of animal biotechnology: from molecular, genetic, genomics and development issues to their technological applications. Prerequisites: AN SC 201, BIOL 110, CHEM 110, CHEM 112. Instructor: W. Liu.

- Animal Science 215 (GS) **PETS IN SOCIETY (3)** Introduction to the varied roles that companion animals play in human society and their impact on human activity and well-being. Instructor: N. A. Dreschel.
- Animal Science 217 **INTRODUCTION TO HORSE JUDGING (2)**. Introductory analysis of halter and performance classes of stock-type horses, with emphasis on conformation, gaits, patterns, and oral reasons. Instructors: C. Grant (Fall) & B. A. Egan (Spring).
- Animal Science 225 **INTRODUCTION TO DAIRY JUDGING (1)**. Training in the visual evaluation of dairy cattle and practice in defending decisions through oral reasons. Instructor: D. Olver.
- Animal Science 226 **MEAT SELECTION AND GRADING (2)**. Training in identifying, grading, and judging carcasses and wholesale cuts of meat and in selection and identification of specification cuts. Prerequisite: AN SC 201. Instructor: J. Campbell
- Animal Science 290 **CAREERS IN ANIMAL AGRICULTURE (1)**. A description and analysis of career opportunities in the animal science and allied industries. Instructors: R. Mikesell, R. Cloninger, & A. Kocher.
- Animal Science 291 **EXTERNSHIP WITH ANIMAL SCIENCE BUSINESS (1-2)**. Students will obtain a one-week on site work experience with an animal-related agribusiness. Instructors: R. Mikesell and R. Cloninger.
- Animal Science 296 **INDEPENDENT STUDIES (1-18)**. Career projects or studies which are supervised on an individual basis and which fall outside the scope of formal classes. Dairy and Animal Science majors may apply a total of six credits of Animal Science 296 to the total credits required for graduation. **This course may not be used for specific course requirements in the Animal Science major. In order to pursue an independent study, the student must contact the faculty member and reach a mutual agreement regarding the topic, number of credits and mode of conduct. The student must complete a Course Proposal Form and return the form to the Department Office during the first five days of classes. Any faculty member may work with any student.** Coordinator: R. Mikesell.
- Animal Science 297 **SPECIAL TOPICS (1-9)**. Formal courses offered infrequently on a topic or special interest subject. Coordinator: R. Mikesell.
- Animal Science 300 **INTEGRATED ANIMAL BIOLOGY (3)**. An integrated study of the biology of domestic animal growth and the underlying cellular, endocrine, and immune systems involved. Prerequisites: BIOL 110; at least third semester standing. Instructors: F. Diaz and E. Hines.
- Animal Science 301 **PRINCIPLES OF ANIMAL NUTRITION (3)**. Nutrients and their metabolism; the nutritional requirements of livestock; the nutritional value of various feeds; principles of ration formulation. Prerequisite: CHEM 202, CHEM 210. Instructors: K. Harvatine and T. Felix
- Animal Science 305 **COMPANION ANIMAL NUTRITION AND MANAGEMENT (3)**. Principles of care and nutrition and contemporary importance of companion animals with emphasis on canine and feline species. Prerequisite: AN SC 201. Instructor: N. A. Dreschel.
- Animal Science 306 **SWINE PRODUCTION AND MANAGEMENT (3)**. Application of the principles of enterprise and facility development, operations management, quality control, public relations, marketing for the efficient operation of a swine production business. Prerequisite: AN SC 201. Instructor: E. Hines.
- Animal Science 308 **SHEEP AND GOAT PRODUCTION AND MANAGEMENT (3)**. Application of principles of nutrition, breeding, physiology, health, facilities, marketing, and product development, to animal production agriculture. Prerequisite: AN SC 201. Instructor: T. Ott

<u><i>Animal Science 309</i></u>	BEEF CATTLE PRODUCTION AND MANAGEMENT (4). Application of principles of nutrition, breeding, physiology, health, facilities, and marketing to produce and manage beef efficiently. Prerequisite: AN SC 201. Instructor: D. M. Kniffen.
<u><i>Animal Science 310</i></u>	DAIRY CATTLE PRODUCTION AND MANAGEMENT (3). Principles of dairy management including the dairy industry, reproduction and housing. Prerequisite: AN SC 201. Instructors: A. J. Heinrichs, D. R. Olver, T. Edwards, and T. Ott.
<u><i>Animal Science 311</i></u>	POULTRY PRODUCTION AND MANAGEMENT (4). The application of fundamental concepts and preparation for careers in the economically integrated commercial poultry industry. Prerequisite: AN SC 201. Instructor: J. Boney.
<u><i>Animal Science 315</i></u>	SMALL ANIMAL HEALTH AND DISEASE (3). Introduction to the principles of small animal health, including the recognition, prevention and control of common small animal diseases. Prerequisite: MICRB 106 or MICRB 201. Instructor: J. B. Werner.
<u><i>Animal Science 317</i></u>	HORSE HANDLING AND TRAINING (3). Responses of horses to various stimuli during the training period. Laboratory exercises involve extensive practice with young horses. Prerequisites: AN SC 327 and approved level of horsemanship. Instructor: B. A. Egan.
<u><i>Animal Science 322</i></u>	ANIMAL GENETICS AND SELECTION (3). The fundamental principles of genetics as applied to breeding farm animals. Instructor: C. D. Dechow.
<u><i>Animal Science 324</i></u>	VALUE DETERMINATION OF MEAT ANIMALS (3). Live Animal and carcass evaluation of cattle, sheep, and swine to determine value of market animals and meat products. Instructor: B. Williamson.
<u><i>Animal Science 327</i></u>	HORSE PRODUCTION AND MANAGEMENT (4). Principles of selection, breeding, feeding, management and marketing of horses; emphasis on light leg horses. Prerequisite: AN SC 201. Instructors: B. A. Egan & W. B. Staniar.
<u><i>Animal Science 346</i></u>	ANIMAL ENTERPRISE ANALYSIS (3). Evaluating livestock operations within and across enterprises has become a vital skill to being profitable today. The nexus of financial performance and production management is the catalyst to profitable and sustainable operations. Concurrent: ANSC 201. Instructors: L.A. Holden & R. Goodling.
<u><i>Animal Science 350</i></u>	DAIRY PROBLEM SOLVING (2). Students will use dairy records to analyze herd performance in order to identify bottlenecks for higher productivity. Prerequisite or concurrent: AN SC 310. Instructor: C. D. Dechow.
<u><i>Animal Science 357</i></u>	EQUINE BROODMARE & FOAL CARE (3). This course is an in depth study of late gestation broodmares, fetal development, pre-foaling indicators of readiness for birth, and post-partum care and management of the mare and foal. Students completing this course should be well prepared to be employed on breeding farms as broodmare or foaling. Prerequisite: AN SC 327. Instructors: B. Egan & E. Jdrzejewski.
<u><i>Animal Science 395</i></u>	ANIMAL SCIENCE INTERNSHIP (1-12). Supervised field experience and study related to the student's major professional interest. Written and oral critique of the activity is required. Prerequisites: Dairy and Animal Science majors who have a GPA of 2.0 or higher, completed 6 credits in their major field of study and have obtained permission of their faculty advisor and course instructor. Coordinator: P. Clauer.
<u><i>Animal Science 410</i></u>	ADVANCED DAIRY HERD MANAGEMENT (4). Application of dairy herd management principles using case studies and actual dairy farm situations. Students will be required to seek solutions to problems and to make management decisions using actual dairy farms and/or case studies. Prerequisite: AN SC 310. Instructors: L. Holden, A. Hristov, and T. Ott.


- Animal Science 413* **TRANSGENIC BIOLOGY (3).** The principles and concepts used to generate genetically engineered animals by pronuclear, knockout, and cloning methods; and applied biotechnology applications. Prerequisite: B M B 211 or BIOL 230W and AN SC 322 or BIOL 222. Instructor: T.H. Kim
- Animal Science 415* **COMPANION ANIMAL BEHAVIOR (3).** Detailed study of companion animal behavior; including individual, developmental, and environmental bases of behavior with applied demonstration and discussion. Prerequisite: BIOL 110. Instructor: N. A. Dreschel.
- Animal Science 418* **AN SC 418 (AGEC 418) and (SOILS 418) NUTRIENT MANAGEMENT IN AGRICULTURAL SYSTEMS (3).** Comprehensive review of nutrient flow in animal agricultural systems, environmental regulations, and environmental stewardship practices. Instructors: R. Meinen & C. White.
- Animal Science 419W* **APPLIED ANIMAL WELFARE (3).** Assessment of management practices impacting animal welfare; devoted to livestock species, companion animals, captive exotic species, and animals in research. Prerequisite: AN SC 201 or 6 credits of biology. Instructor: A. Macrina.
- Animal Science 420* **ANIMAL NUTRITION AND FEED TECHNOLOGY (4).** Feedstuff evaluation, quality control, handling, storage; life cycle feeding of beef cattle, dairy cattle, sheep, swine, horses, and poultry. Prerequisite: AN SC 301. Instructors: A. Hristov, W. B. Staniar, T. Felix, R. Elkin, & R. Mikesell.
- Animal Science 421* **POULTRY EVALUATION AND SELECTION (3)** Introduction and application of standards and principles used to evaluate live poultry and poultry products. Prerequisite: permission of program. Instructors: P. Clauer.
- Animal Science 422W* **DAIRY CATTLE EVALUATION AND SELECTION (3).** Methods used in evaluation of production and type traits and their role in selecting dairy breeding stock domestically and internationally. Prerequisite: AN SC 322. Instructors: D. R. Olver and C. D. Dechow.
- Animal Science 423* **COMPARATIVE PHYSIOLOGY OF DOMESTIC ANIMALS (3)** A comparative approach to understanding body function in domesticated avian and mammalian species. Prerequisite: BIOL 110. Instructor: A. G. Lorenzoni.
- Animal Science 424* **LIVESTOCK BREEDING EVALUATION AND SELECTION (3).** Evaluation and selection of beef cattle, sheep, and swine: critical analysis of performance records and genetic evaluations. Prerequisite: AN SC 324. Instructor: B. Williamson.
- Animal Science 425* **AN SC 425 (VB SC 425) PRINCIPLES OF AVIAN DISEASES (3).** Principles of pathogenesis, diagnosis and control of diseases in poultry and other avian populations. Prerequisites: AN SC 201, BIOL 110, 4 credits in microbiology and 3 credits in anatomy and/or physiology. Instructor: A. G. Lorenzoni.
- Animal Science 426* **ADVANCED JUDGING AND SELECTION (2-4).** Development of critical thinking and communication skills through evaluation and selection of animals and animal products. Prerequisites: AN SC 322; Instructor approval. Instructors: D. Olver, B. A. Egan, B. Williamson, P. J. Clauer, and J. Campbell.
- Animal Science 427* **MILK SECRETION (3).** Development and physiology of the mammary gland and factors which affect the amount and composition of milk produced. Prerequisites: AN SC 201 Instructor: A. Macrina.
- Animal Science 429* **ADVANCED BEEF CATTLE PRODUCTION (3).** Application of scientific and business principles to practical production and management issues using case studies or selected live settings. Prerequisite: AN SC 309. Instructor: D. Kniffen.

- Animal Science 431 **PHYSIOLOGY OF MAMMALIAN REPRODUCTION (3).** Physiological processes of reproduction in animals, including the use of current and emerging technologies. Prerequisite: 3 credits in animal physiology. Instructor: T. Ott.
- Animal Science 432 **TECHNIQUES IN CATTLE REPRODUCTION (1).** Demonstration and practice in estrus detection, inseminating techniques, pregnancy detection, embryo recovery and transfer methods. Prerequisite or concurrent: AN SC 309 or 310. Instructor: R. Cloninger.
- Animal Science 437 **AN SC 437 and (AEE 437). EQUINE FACILITATED THERAPY (3).** Equine Facilitated Therapy uses equine-related activities to contribute positively to the wellbeing of people with disabilities. Prerequisite: AN SC 327. Instructor: A. Macrina.
- Animal Science 447 **EQUINE EXERCISE PHYSIOLOGY (3).** Course is an in depth examination of the topic of equine exercise physiology. It covers anatomy and basic physiology of pertinent body systems in the first third of the semester, management, training, and therapy responses in the middle third, and examples of application in the equine industry in the last third. Instructor: D. Smarsh.
- Animal Science 450 **DAIRY FARM MANAGEMENT SYSTEMS (3).** Capstone course emphasizing integration of dairy farm management principles into whole farm systems. Prerequisites: AN SC 310, AN SC 350, AN SC 410. Instructor: L. A. Holden.
- Animal Science 451 **DAIRY SYSTEMS ANALYSIS (1).** Students will evaluate all aspects of a working dairy farm business. Prerequisites: AN SC 310, AN SC 410. Instructors: L. A. Holden and V. Ishler.
- Animal Science 457 **EQUINE REPRODUCTION AND BREEDING FARM MANAGEMENT (3).** Advanced aspects of equine reproduction will be covered, including collection of semen, processing it for shipment, and insemination of mares. Prerequisites: AN SC 327. Instructor: E. Jedrzejewski.
- Animal Science 467W **EQUINE NUTRITION AND FEEDING (3).** Equine gastrointestinal anatomy and physiology; energy and nutrient requirements for body functions; applied interrelationships between nutrition, health, and performance. Prerequisite: AN SC 301. Instructor: W. B. Staniar.
- Animal Science 494 **UNDERGRADUATE RESEARCH (1-6 per semester/maximum of 6)** Independent undergraduate research directed by an Animal Science faculty supervisor. Prerequisite: junior or senior status approval of an Animal Science faculty supervisor and approval of the Undergraduate Program Coordinator. Coordinator: R. Mikesell
- Animal Science 496 **INDEPENDENT STUDIES (1-18).** Creative projects or studies which are supervised on an individual basis and which fall outside the scope of formal courses. Animal Science majors may apply a total of six credits of AN SC 496 to the total credits required for graduation. **This course may not be used for specific course requirements in the Animal Sciences major. In order to pursue an independent study, the student must contact the faculty member and reach a mutual agreement regarding the topic, number of credits and mode of conduct. The student then notifies the course coordinator regarding the agreement in order to facilitate record keeping. Any faculty member may work with any student. The coordinator serves as a focal point for communications and records. The student is required to complete a Course Proposal Form. Prerequisites: 6 credits in animal science. Coordinator: R. Mikesell**
- Animal Science 497 **SPECIAL TOPICS (1-9).** Formal courses offered infrequently on a topic or special interest subject. Prerequisite: 3 credits in animal science. Coordinator: R. Mikesell
- Animal Science 499 **FOREIGN STUDIES (1-12).**

Penn State Animal Science Courses

Department of Animal Science

PENNSTATE

 College of Agricultural Sciences

SEMESTER SCHEDULE OF ANIMAL SCIENCE COURSES OFFERED

<u>AN SC Courses (credits)</u>	<u>Title</u>	<u>Semester Offered</u>
100 (3)	Introduction to Animal Industries	Spring
107 (3)	Introduction to Equine Science and Industry	Fall/Spring
117(2)	Equine Marketing	Spring
201 (4)	Animal Science	Fall/Spring
202W (3)	Contemporary Issues in Animal Agriculture	Fall/Spring
207 (2)	(FD SC) Animal Products Technology	Fall
208 (1)	(FD SC) Animal Products Technology Laboratory	Fall/Spring
211 (3)	Introduction to Avian Biology	Spring
213 (3)	Introduction to Animal Biotechnology	Fall
215 (3) (GS)	Pets in Society	Fall/Spring
217 (2)	Introduction to Horse Judging	Fall
225 (1)	Introduction to Dairy Judging	Spring
226 (2)	Meat Selection and Grading	Spring
290 (1)	Careers in Animal Agriculture	Fall
291(1-2)	Externship with Animal Science Business	Spring
300 (3)	Integrated Animal Biology	Spring
301 (3)	Principles of Animal Nutrition	Fall/Spring
305 (3)	Companion Animal Nutrition and Management	Fall
306 (3)	Swine Production and Management	Fall (odd years)
308 (3)	Sheep and Goat Production and Management	Spring (even years)
309 (4)	Beef Cattle Production and Management	Spring
310 (3)	Dairy Cattle Production and Management	Spring
311 (4)	Poultry Production and Management	Fall
315 (3)	Small Animal Health and Disease	Spring
317 (3)	Horse Handling and Training	Spring
322 (3)	Animal Genetics and Selection	Fall
324 (3)	Value Determination of Meat Animals	Fall
327 (3)	Horse Production and Management	Fall
346 (3)	Animal Enterprise Analysis	Spring
350 (2)	Dairy Problem Solving	Spring
395 (1-12)	Animal Science Internship	All
410 (4)	Advanced Dairy Herd Management	Fall
413 (3)	Transgenic Biology	Spring
415 (3)	Companion Animal Behavior	Spring
418 (3)	(AGECO and SOILS) Nutrient Management in Agricultural Systems	Fall
419W (3)	Applied Animal Welfare	Fall
420 (4)	Animal Nutrition and Feed Technology	Spring
421 (3)	Poultry Evaluation and Selection	Spring
422W (3)	Dairy Cattle Evaluation and Selection	Spring
423 (3)	Comparative Physiology of Domestic Animals	Spring
424 (3)	Livestock Breeding Evaluation and Selection	Spring
425 (3)	(VB SC) Principles of Avian Diseases	Fall
426 (2)	Advanced Judging and Selection	Fall/Spring
427 (3)	Milk Secretion	Spring
429 (3)	Advance Beef Cattle Production	Fall
431(4)	Physiology of Mammalian Reproduction	Fall
432 (1)	Techniques in Cattle Reproduction	Fall
437 (3)	Equine Facilitated Therapy	Fall (even years)
447 (3)	Equine Exercise Physiology	Fall
450 (3)	Dairy Farm Management Systems	Spring
451 (1)	Dairy Systems Analysis	Fall/Spring
457 (3)	Equine Reproduction and Breeding Farm Management	Fall
467W(3)	Equine Nutrition and Feeding	Spring

Penn State Animal Science Student Clubs

Department of Animal Science

PENNSSTATE



College of Agricultural Sciences

Penn State recognizes that extracurricular activities contribute to the development of a well-rounded individual. The University provides many opportunities for entertainment, supplemental education, or involvement. Within the Penn State system there are some 400 student organizations.

BLOCK AND BRIDLE CLUB

The Penn State Chapter of the National Block and Bridle Club is open to any Penn State student with an interest in the animal sciences industry. Exciting club activities include the welcome back picnic, club calf sale, industry tours, and the fall and spring meat sales. The club also holds an annual "Beef up the Blood Supply" spring blood drive and also collects "Blood for Bats" for the Philadelphia Zoo. Club members have a chance to travel to Harrisburg for the Keystone International Livestock Exposition, to help with the judging contest. Each spring, the club holds the annual Little International Livestock Exposition, where students have the opportunity to learn hands on how to prepare the exhibit horses, sheep, swine and beef cattle. Every year the club participates in the National Block and Bridle Convention. Previous conventions have been held in Texas, Missouri and Kentucky. Club meetings are held the first and third Thursday of each month in 101 ASI Building. Advisers: Dr. Dan Kniffen, 320 ASI, 814-865-7809, Mr. Chris Grant 863-0834; Dr. Ed Mills 863-9415, & Mr. Ben Williamson 307 ASI, 814-867-4917.

COLLEGIATE HORSEMEN'S ASSOCIATION AT PENN STATE (CHAPS)

The Collegiate Horsemen's Association of Penn State (CHAPS) is a club for all Penn State equine enthusiasts. It is an affiliate chapter of the American Collegiate Horseman's Association (ACHA) and as such participates in the national convention each year, hosting the convention in 2009. Members participate in horse-related activities such as therapeutic riding, horse rescue, clinics, expositions, horse shows, fun shows, trail rides, and socials. Many CHAPS members with similar riding goals and interests form lesson groups. CHAPS meetings will be every other Tuesday's of the month. Time and location will be announced. Advisers: Mr. Brian Egan, 317 Henning, 863-0569; Ms. Andrea Kocher, 314 ASI, 863-3957.

DAIRY SCIENCE CLUB

The Dairy Science Club is open to Penn State students from all colleges who have an interest in the dairy industry. Major emphasis is placed on promotional, educational, and service events. Club activities are numerous and include the Osteochallenge Walk/Run, Nittany Lion Fall Classic Holstein Consignment Sale, Holiday Cheesebox Sale, Dairy Days Cow Camp, Meet-a-Cow Day, Spring Judging Contest, and the Dairy Exposition fitting and showmanship competition. Club members travel to other states during the annual spring break trip. Recent domestic destinations included California, Colorado, Arizona, and Washington. International destinations include Ireland, New Zealand, Argentina, and Costa Rica. The Dairy Science Club has been recognized as the nation's outstanding student chapter by the American Dairy Science Association many times over the last 10 years. The Penn State Dairy Science Club meets every other Wednesday evening at 7:00 p.m. in 101 ASI Building. Advisers: Mr. Dale Olver, 319 Henning, 814-863-3914; Dr. Chad Dechow, 333 Henning, 814-863-3659.

POULTRY SCIENCE CLUB

The Penn State Poultry Science Club is open to any student with an interest in poultry and avian species. Emphasis is placed on educational, service, and social events and activities. The two most anticipated events each year are the trip to Atlanta for the International Poultry Trade Show and College Student Career Program and the Spring Banquet. Other club activities include the fall and spring semester educational tours, community service projects (Thon, Heifer International, and Easter baskets for the Food Bank), the fresh turkey sale at Thanksgiving and the smoked turkey sale at Easter, helping at the PA Farm Show, and numerous social activities. The Poultry Science Club has been consistently recognized nationally. The Club has won the National Scrapbook of the Year competitions and has been recognized as the National Club of the Year numerous times. Check out our web page at <http://www.clubs.psu.edu/up/psc/Default.html> for more information. The Penn State Poultry Science Club typically meets on the second and fourth Wednesday of each month at 7:00 p.m. Come join us for dinner and a guest speaker. For more information, contact Phillip J. Clauer (814-863-8960, pclauer@psu.edu).

PRE-VET CLUB (sponsored by the Department of Veterinary and Biomedical Sciences)

The Pre-Vet Club is designed to allow students interested in veterinary medicine as a career to interact with each other, and also to provide an opportunity to gain information and experiences relevant to veterinary medicine. The club meets every other Monday evening during the regular academic year to discuss current and upcoming activities and events as well as to listen to and interact with guest speakers from veterinary schools and hospitals. Recent activities have included coordination of dog shows at the Ag Arena, medical assistance at an annual competitive equine trail ride, adoption of a wolf at a wildlife preserve, and trips to the annual American PreVeterinary Medical Association (APVMA) meeting and nearby veterinary schools. The club maintains a display case in the front lobby of the Henning Building which lists current and future activities as well as officer names and addresses. For more information, contact Dr. Lester Griel at (814) 865-7696 or lcg1@psu.edu: <http://www.clubs.psu.edu/up/prevetclub/>.

SMALL AND EXOTIC ANIMAL CLUB (SEAC)

SEAC members concern themselves with current issues of animal welfare, care, and use. The purpose of this group is to promote the improvement of animal welfare, increase the awareness of animal use in agriculture among students of the University and the community, and bring about enhanced animal well-being. During the semester there are bimonthly meetings that consist of a speaker on an area of interest to the group followed by a business meeting. Some of the club's activities include animal-assisted therapy at local nursing homes and youth centers, volunteer at T&D Cats of the World and Centre County PAWS, sponsoring the PAWS Pet Extravaganza. The club takes trips to research facilities, zoos, and participates in service projects. They also participate in the PSU Dance Marathon-THON. The club is open to any student with the desire to learn about the issues facing animal welfare today. SEAC meets every other Wednesday evening at 8:00 p.m. in 324 ASI Building. Adviser: Dr. Nancy Dreschel, 312 ASI, 814-863-4197.

PENN STATE COLLEGIATE CATTLEWOMEN CLUB

Penn State Collegiate Cattlewomen is a club available to students from any college who has an interest in cattle, both beef and dairy. Major emphasis is placed on promotional activities, educational events, and social events that will forge a closer bond among collegiate women with an interest in the animal industry. Important activities include the welcome back picnic, farm and industry tours, Meat-In Day, and attendance to the National Cattleman's Beef Association Cattle Industry Annual Convention and Trade Show, where the American National Cattlewomen hold their annual meeting. CCW also works closely with Pennsylvania Cattlewomen in their efforts in promoting the beef industry. In order to better endorse the beef industry, CCW will complete the Master of Beef Advocacy Program, a course that provides a chance to improve our speaking skills and hone our public relations abilities. Cattlewomen club meetings are held the second and fourth Thursdays of the month at 8 pm in 324 ASI. Advisers: Dr. Daniel Kniffen , 320 ASI, 814-865-7809; Mr. Ben Williamson, 307 ASI, 814-867-4917.

PENN STATE EQUINE RESEARCH TEAM

The Penn State Equine Research Team is a club that is open to anyone with an interest in equine research. This team presents an opportunity for undergraduate students to gain exposure to this field, as well as develop a basic understanding of the "real world" of equine research. The meetings provide a setting for students with the same interests to engage in informal and enlightening discussion of equine science. This club is also a great opportunity for students to learn about graduate school opportunities here at Penn State, and across the country. Members will have the opportunity to help out with research projects being carried out throughout the year, as well as gain hands on experience and insight into the world of equine research. Equine Research Team meetings will be the 3rd Tuesday of the month at 5:45 PM in 324 ASI. Adviser: Dr. Burt Staniar, 316 ASI, 814-865-0698; Dr. Danielle Smarsh, 315 ASI, 814-865-7810.

PENN STATE REPRODUCTION RESEARCH TEAM

The purpose of the Penn State Reproduction Research Team is to provide undergraduate students experience working with dairy cattle, identifying signs of estrus and monitoring the health and welfare of cows. The Penn State Reproductive Research Team's main goal is to assist in observations of estrous behavior and general health checks of dairy cows used for reproductive biology research. Each student will have the opportunity to interact with graduate students and postdoctoral associates in reproductive biology at monthly meetings, learn about current research projects and why this research is likely to benefit both agriculture and human medicine. Adviser: Dr. Joy Pate, 814-863-0558.

Penn State Animal Science Judging Teams

Department of Animal Science

PENNSSTATE



College of Agricultural Sciences

Penn State recognizes that extracurricular competitive events contribute to the development of a well-rounded individual. The University provides many opportunities for entertainment, supplemental education, or involvement. Within the Penn State's College of Agricultural Sciences there are approximately 8 competitive teams, 5 of which have their foundation in the Animal Sciences.

DAIRY CATTLE JUDGING TEAM

The Dairy Cattle Judging Team is selected from interested students who attend practices throughout the spring and summer. Four student judges make up the Penn State team. Contest opportunities include the Eastern States Exposition, Springfield, MA; PA All-American Dairy Show, Harrisburg; and World Dairy Exposition, Madison, Wisconsin. A second team participates at the North American Livestock Exposition Contest in Louisville, KY. Intensive training sessions are held at the Maryland State Fair and at farms around the nation. Contestants place classes, give reasons, and meet students from other universities. For more information, contact Mr. Dale Olver at (814) 863-3914 or dolver@psu.edu.

MEAT JUDGING TEAM

The Penn State Meat Judging Team is open to any student within the College or University who has a desire to learn more about the selection and grading techniques used to place monetary value on commodities in the meat industry. Students interested in the team should enroll in AN SC 226-Meat Selection & Grading (spring). This course is an introduction to meat judging and explains the factors and terminology associated with evaluation of beef, pork and lamb. Those enrolled in the spring course will be eligible for the one intercollegiate spring contest that Penn State University competes in. Those completing the AN SC 226 course will then be eligible for AN SC 426-Advanced Judging and Selection (fall). The team of four to seven students competes at three national intercollegiate contests annually in the following rotation: Southeastern, Columbus, OH & Lexington, KY (2-day contest in April); Eastern National, Wyalusing, PA (October); International, Dakota City, NE (November). Unlike various other judging teams, meat judging focuses on written communication (reasons) to defend decisions made in placing a class of beef, pork or lamb. Institutional meat purchasing specifications of the three species are also a valuable component to understanding what meat commodities are available to the consumer. For more information, please contact Dr. Jonathan Campbell at [\(814\) 867-2880](tel:8148672880) or jac69@psu.edu.

HORSE JUDGING TEAM

Members of the Penn State Horse Judging Team are selected from those students who have demonstrated their ability and interest in applying the “form and function” to selection of American Quarter Horses. Students interested in the team should enroll in AN SC 217-Introduction to Horse Judging (spring) prior to enrolling in AN SC 426-Advanced Judging and Selection (fall) and competing for a position on the team. The four member team and one alternate compete at the All-American Quarter Horse Congress, Columbus, OH, and The World Quarter Horse Show in Oklahoma City, Oklahoma. Contestants place and give reasons on both halter and performance classes. Further practice in judging can be obtained in AN SC 327 and in special sessions scheduled for students interested in contest competition. For more information, contact Mr. Brian Egan at (814) 863-0569 or began@psu.edu.

LIVESTOCK JUDGING TEAM

The Penn State Livestock Judging Team is open to any student within the University who has a sincere interest in the improvement of meat animals utilizing modern techniques of evaluation and methods of selection. Students interested in the team should enroll in AN SC 324-Value Determination of Meat Animals (fall) and AN SC 424-Livestock Breeding, Evaluation and Selection (spring) prior to enrolling in AN SC 426-Advanced Judging and Selection (fall) and competing for a position on the team. The team of five to ten competes at four regional contests and two national intercollegiate contests: All-East, various universities east of the Mississippi; Keystone International, Harrisburg, PA; Main Event, Dayton, OH; American Royal, Kansas City, MO; and North American International at Louisville, KY. Students judge market and breeding beef cattle, sheep and swine, and provide oral reasons on selected classes. Performance records are incorporated in a variety of classes. For more information, contact Mr. Ben Williamson at (814) 865-1362 or bcw13@psu.edu.

POULTRY JUDGING TEAM

The Penn State Poultry Judging Team gives students the opportunity to attend two events per year. These poultry judging events consist of table egg quality, meat-carcass quality, breeder performance, and breed phenotype characteristics. The fall contest is held in Arkansas and the spring event takes place in Louisiana. By participating in the Poultry Judging Team, the benefit to students is four-fold: (1) provides decision analysis skills associated with genetic potential of poultry breeds; (2) provides decision analysis of poultry commodity quality (eggs/meat); (3) provides potential employer's with information about students' association with extra-curricular activities related to poultry industry; and (4) provides students with interaction among national agricultural programs and students. For more information, contact Mr. Phillip Clauer at (814) 863-8960 or pclauer@psu.edu.



If you are interested in any domestic animal species, this major gives you the opportunity to develop basic and applied knowledge in biological sciences, nutrition, genetics, reproduction, physiology, economics, business management, and animal management. Depending on your interests and career goals, you can define your program of study by choosing between two options, Business & Animal Management or Science.

The **Business and Animal Management** option combines business and the production and management of animals and/or poultry. This option can help prepare you for careers in agribusiness/farm management, technical sales and service, cooperative extension, or commodities promotion.

The **Science** option provides opportunity for more in-depth study of the basic sciences relevant to animal biology. This option can help you prepare for veterinary school, graduate study in nutrition, physiology, reproduction, or genetics, or careers in the biomedical or research industries.

New and exciting courses in Animal Biotechnology, Companion Animal Science, and Equine Science can be incorporated into either option. You can also get hands-on experience with the college's herds and flocks and at the meats and research laboratories. Internships, externships, and summer employment can help you obtain a variety of work experiences. You also can take advantage of international study tours, and many Animal Sciences students participate in study abroad programs.

Why Major in Animal Science?

Consider majoring Animal Science if you

- are preparing for graduate or veterinary school
- would like a career in research relating to and/or using animals
- would like to manage a farm or business related to animals
- like to work with people in addition to animals and may be interested in a career in technical sales or service, cooperative extension, or promotions

Career Opportunities for Animal Science Graduates

Employment opportunities for Animal Sciences graduates include, but are not limited to the following:

- agribusiness manager
- veterinarian
- farm manager
- feed industry sales/service
- pharmaceutical sales/service
- artificial insemination technician
- ag finance
- zookeeper
- cooperative extension
- federal meat inspector
- equipment sales/service
- government agency
- animal caretaker
- research and development
- livestock buyer
- marketing director
- news industry editor
- stable manager
- public relations
- quality control manager

For more information about this major contact:

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