Animal Nutritional Sciences

Degrees Offered

• Bachelor of Science
• Bachelor of Science in Agriculture

Bachelor of Science - Animal & Nutritional Sciences Major

The curriculum in science, with its flexible design, provides the necessary background in biochemistry, chemistry, mathematics, physics, and modern concepts of biology in preparation for professional schools of dentistry, human medicine, optometry, pharmacy, veterinary medicine or graduate study in such fields as animal breeding, animal physiology, biochemistry and nutrition.

Bachelor of Science in Agriculture - Animal & Nutritional Sciences Major

This curriculum provides the necessary background in agricultural economics, agronomy, breeding, nutrition, and physiology to prepare for careers in production and management of dairy, livestock or poultry, and in food processing and technology.

Click the link below to view the corresponding Degree Requirements and Suggested Plans of Study.

• Bachelor of Science - Animal & Nutritional Sciences (p. 1)
• Bachelor of Science in Agriculture - Animal & Nutritional Sciences (p. 3)

General Education Foundations

Please use this link to view a list of courses that meet each GEF requirement. (http://registrar.wvu.edu/gef)

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

General Education Foundations

<table>
<thead>
<tr>
<th>GEF</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Composition &amp; Rhetoric</td>
<td>3-6</td>
</tr>
<tr>
<td></td>
<td>ENGL 101 &amp; ENGL 102 Introduction to Composition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; Rhetoric, and Composition, Rhetoric, and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or ENGL 103 Accelerated Academic Writing</td>
<td></td>
</tr>
<tr>
<td>F2A</td>
<td>Science &amp; Technology (may also fulfill program</td>
<td>4-6</td>
</tr>
<tr>
<td></td>
<td>Science requirements)</td>
<td></td>
</tr>
<tr>
<td>F2B</td>
<td>Science &amp; Technology (may also fulfill program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science requirements)</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Mathematics &amp; Quantitative Reasoning</td>
<td>3-4</td>
</tr>
<tr>
<td>F4</td>
<td>Society &amp; Connections</td>
<td>3</td>
</tr>
<tr>
<td>F5</td>
<td>Human Inquiry &amp; the Past</td>
<td>3</td>
</tr>
<tr>
<td>F6</td>
<td>The Arts &amp; Creativity</td>
<td>3</td>
</tr>
<tr>
<td>F7</td>
<td>Global Studies &amp; Diversity</td>
<td>3</td>
</tr>
<tr>
<td>F8</td>
<td>Focus (may be satisfied by completion of a minor</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>double major, or dual degree)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>31-37</td>
</tr>
</tbody>
</table>

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

CURRICULUM REQUIREMENTS FOR BACHELOR OF SCIENCE IN AGRICULTURE - ANIMAL & NUTRITIONAL SCIENCES MAJOR

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101 &amp; ENGL 102</td>
<td>Introduction to Composition and Rhetoric &amp; Composition, Rhetoric, and Research</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 103</td>
<td>Accelerated Academic Writing</td>
<td></td>
</tr>
<tr>
<td>GEF2 Science &amp; Technology (may also fulfill program Science requirements)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEF3 Mathematics &amp; Technology (may also fulfill program Science requirements)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEF Requirements 4 - 8</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>A&amp;VS 191</td>
<td>First-Year Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Biological and Physical Sciences Requirements (students must take 24 hours of science courses)
### Biology

A&VS 251 and/or PLSC 206 may be substituted for biology courses

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Algebra or equivalent</td>
<td>8</td>
</tr>
<tr>
<td>Science Electives</td>
<td>3</td>
</tr>
<tr>
<td>Courses in Agriculture</td>
<td>42</td>
</tr>
</tbody>
</table>

#### Elect a minimum of a three-credit course, excluding Assigned Topics, in each of the following categories. Elect additional courses to obtain a total of 45 hours in the college.

- Animal Science
- Plant Science
- Soil Science
- Agriculture Economics

#### Capstone Experience (Choose one of the following):

- Fulfills Writing and Communication Skills requirement
- A&VS 402 Values and Ethics
- A&VS 491 Professional Field Experience
- A&VS 496 Senior Thesis

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

Free Electives (Number of electives may vary depending on GEF courses taken. Students must earn at least 120 credits to graduate.)

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>23</td>
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</table>

Total Hours

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
</tr>
</tbody>
</table>

## SUGGESTED PLAN OF STUDY FOR BACHELOR OF SCIENCE IN AGRICULTURE - ANIMAL & NUTRITIONAL SCIENCES MAJOR

### First Year

#### Fall

<table>
<thead>
<tr>
<th>ENGL 101 (GEF)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;VS 191</td>
<td>2</td>
</tr>
<tr>
<td>Select one of the following (GEF):</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 101</td>
<td>4</td>
</tr>
<tr>
<td>&amp; BIOL 103</td>
<td>4</td>
</tr>
<tr>
<td>A&amp;VS 251</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 206</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 111 &amp; 111L</td>
<td>4</td>
</tr>
<tr>
<td>MATH 124 (GEF 3)</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

#### Spring

| A&VS 150 | 2 |
| ARE 150 (GEF) | 3 |
| BIOL 102 & BIOL 104 | 4 |
| CHEM 112 & 112L | 4 |
| GEF | 4 |

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
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</tbody>
</table>

### Second Year

#### Fall

<table>
<thead>
<tr>
<th>ENGL 102 (GEF)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;VS 251</td>
<td>4</td>
</tr>
<tr>
<td>WMAN 150 (GEF)</td>
<td>3</td>
</tr>
<tr>
<td>Science elective</td>
<td>3</td>
</tr>
<tr>
<td>GEF</td>
<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

#### Spring

| PLSC 206 | 4 |
| ANPH 301 | 4 |
| 3 Science elective | 4 |
| GEF | 4 |

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

### Third Year

#### Fall

| ANNU 361 | 3 |
| ANPR 341 | 3 |
| ANPR 343 | 3 |
| ARE 382 | 3 |
| GEF | 3 |

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
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</tbody>
</table>

#### Spring

| AGRN 202 | 3 |
| AGRN 203 | 3 |
| ANPH 400 | 3 |
| ANPR 338 | 3 |
| Electives | 5 |

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>16</td>
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</tbody>
</table>
### Elective

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

### Fourth Year

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARE 435</td>
<td>3</td>
<td>A&amp;VS 402</td>
</tr>
<tr>
<td>ANPR 339</td>
<td>2</td>
<td>Electives</td>
</tr>
<tr>
<td>A&amp;VS 409</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Agriculture Course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>12</td>
</tr>
</tbody>
</table>

Total credit hours: 120

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**CURRICULUM REQUIREMENTS FOR BACHELOR OF SCIENCE - ANIMAL & NUTRITIONAL SCIENCES MAJOR**

Select one of the following: 6

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Introduction to Composition and Rhetoric</td>
</tr>
<tr>
<td>&amp; ENGL 102</td>
<td>Composition, Rhetoric, and Research</td>
</tr>
<tr>
<td>ENGL 103</td>
<td>Accelerated Academic Writing</td>
</tr>
<tr>
<td>GEF 4-8</td>
<td>First-Year Seminar</td>
</tr>
<tr>
<td>A&amp;VS 191</td>
<td></td>
</tr>
</tbody>
</table>

### Science requirements

- Students must reach 40 hours of science credits
- Biology Requirement (also fulfills GEF 2 requirement) 8
- Chemistry Requirement 8
- Physics Requirement 8
- Math Requirement (also fulfills GEF 3 requirement) 6

### Calculus or Advanced Chemistry Requirement 8

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 231</td>
<td>Organic Chemistry: Brief Course</td>
</tr>
<tr>
<td>CHEM 231L</td>
<td>Organic Chemistry: Brief Course - Laboratory</td>
</tr>
<tr>
<td>CHEM 233</td>
<td>Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 234</td>
<td>Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 235</td>
<td>Organic Chemistry Laboratory</td>
</tr>
<tr>
<td>CHEM 236</td>
<td>Organic Chemistry Laboratory</td>
</tr>
<tr>
<td>AGBI 410</td>
<td>Introductory Biochemistry</td>
</tr>
<tr>
<td>MATH 150</td>
<td>Applied Calculus</td>
</tr>
<tr>
<td>MATH 153</td>
<td>Calculus 1a with Precalculus</td>
</tr>
<tr>
<td>MATH 154</td>
<td>Calculus 1b with Precalculus</td>
</tr>
<tr>
<td>MATH 155</td>
<td>Calculus 1</td>
</tr>
<tr>
<td>MATH 156</td>
<td>Calculus 2</td>
</tr>
</tbody>
</table>

### Science Electives (as necessary to reach at least 40 hours of science credits) 2

### Courses in Agriculture 21

### Capstone Experience (Choose one of the following): 3

### Fulfills Writing and Communication Skills requirement

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;VS 402</td>
<td>Values and Ethics</td>
</tr>
<tr>
<td>A&amp;VS 491</td>
<td>Professional Field Experience</td>
</tr>
<tr>
<td>A&amp;VS 496</td>
<td>Senior Thesis</td>
</tr>
</tbody>
</table>

### Free Electives (Number of electives may vary; students must earn a minimum of 120 credits to graduate) 28

### Total Hours 120
### SUGGESTED PLAN OF STUDY FOR BACHELOR OF SCIENCE - ANIMAL & NUTRITIONAL SCIENCES MAJOR

#### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;VS 191</td>
<td>1</td>
<td>A&amp;VS 150</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 101 (GEF 1)</td>
<td></td>
<td>3 BIOL 117</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&amp; BIOL 118</td>
<td></td>
</tr>
<tr>
<td>CHEM 115 &amp; 115L</td>
<td></td>
<td>4 CHEM 116</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 115 &amp; 116 (GEF 2)</td>
<td></td>
<td>4 MATH 128 (if needed or GEF)</td>
<td>3</td>
</tr>
<tr>
<td>Depending on QRA score select one of the following (GEF 3):</td>
<td>3</td>
<td>GEF 4</td>
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<tr>
<td>MATH 124</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 126</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MATH 129</td>
<td></td>
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<td>MATH 150</td>
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<td>MATH 153</td>
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<tr>
<td></td>
<td>15</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

#### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;VS 251</td>
<td>4</td>
<td>4 ANNU 260</td>
<td>3</td>
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<tr>
<td>CHEM 233</td>
<td>3</td>
<td>3 CHEM 234</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 235</td>
<td>1</td>
<td>1 CHEM 236</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 101</td>
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<td>4 PHYS 102</td>
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<td>ENGL 102 (GEF 1)</td>
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<td>3 GEF 6</td>
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<td>GEF 5</td>
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</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
<td>17</td>
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</table>

#### Third Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANPH 301</td>
<td>3</td>
<td>3 A&amp;VS 402</td>
<td>3</td>
</tr>
<tr>
<td>AGBI 410</td>
<td>3</td>
<td>3 GEN 371</td>
<td>4</td>
</tr>
<tr>
<td>AEM 341</td>
<td>4</td>
<td>4 GEF 8</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td>GEF 8</td>
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<tr>
<td></td>
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#### Fourth Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
<td>9</td>
<td>Electives</td>
<td>13</td>
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<tr>
<td>Science Elective</td>
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<tr>
<td></td>
<td>12</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Total credit hours: 120

### Major Learning Outcomes

#### ANIMAL & NUTRITIONAL SCIENCES

1. Graduates will acquire a high level of competency in the basic sciences required for disciplinary competency.
2. Graduates will integrate basic knowledge and managerial skills related to the animal, nutritional and food sciences disciplines.
3. Graduates will acquire sufficient written and oral communication skills, problem solving and critical thinking skills to effectively impact lifelong societal and professional developments critical to their respective discipline of interest.
4. Graduates will attain depth of knowledge relative to the scope of subfields of the animal and nutritional sciences:
a. Animal production, management and marketing
b. Animal nutrition
c. Environmental stewardship

ANNU 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ANNU 260. Animal Nutrition. 3 Hours.
PR: Two courses in chemistry. Digestion and metabolism of food nutrients, nutrient requirements of farm animals, and nutritive values of feeds and rations.

ANNU 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293A. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293B. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293C. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293D. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293E. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293F. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293G. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293H. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293I. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293J. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293K. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293L. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293M. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293N. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293O. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.
ANNU 293T. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293U. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293V. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293W. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293X. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293Y. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 293Z. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298A. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298B. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298C. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298D. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298E. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298F. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298G. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298H. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298I. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298J. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298K. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298L. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298M. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298N. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298O. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298P. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298Q. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298R. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.
ANNU 298S. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298T. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298U. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298V. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298W. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 298X. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 361. Applied Nutrition. 3 Hours.
PR: ANNU 260. Feedstuffs, feed processing storage and additives, nutrient requirements and ration formulation for beef and dairy cattle, sheep, and horses. (2 hr. lec., 1 hr. lab.).

ANNU 362. Applied Nutrition 2. 3 Hours.
PR: ANNU 260. Applied feeding practices, nutrient requirements and ration formulation for poultry, swine, laboratory and companion animals. (2 hr. lec., 1 hr. lab.).

ANNU 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393A. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393B. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393C. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393D. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393E. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393F. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393G. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393H. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393I. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393J. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393K. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393L. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393M. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393N. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.
ANNU 393O. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393P. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393Q. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393R. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393S. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393T. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393U. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393V. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393W. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393X. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393Y. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 393Z. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANNU 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANNU 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492A. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492B. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492C. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492D. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492E. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492F. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492G. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492H. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492I. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 492J. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.
ANNU 492K. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492L. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492M. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492N. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492O. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492P. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492Q. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492R. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492S. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492T. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492U. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492V. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492W. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492X. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492Y. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 492Z. Directed Study. 1-3 Hours. 
Directed study, reading, and/or research.

ANNU 493. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493A. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493B. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493C. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493D. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493E. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493F. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493G. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493H. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493I. Special Topics. 1-6 Hours. 
PR: Consent. Investigation of topics not covered in regularly scheduled courses.
ANNU 493J. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493K. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493L. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493M. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493N. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493O. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493P. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493Q. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493R. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493S. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493T. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493U. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493V. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493W. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493X. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493Y. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 493Z. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494A. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494B. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494C. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494D. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494E. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494F. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494G. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494H. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.
ANNU 494I. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494J. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494K. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494L. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494M. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494N. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494O. Seminar. 1-6 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494P. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494Q. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494R. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494S. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494T. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494U. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494V. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494W. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494X. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494Y. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 494Z. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANNU 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ANNU 497. Research. 1-6 Hours.
Independent research projects.

ANNU 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ANNU 498A. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498B. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498C. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498D. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.
Animal Nutritional Sciences

ANNU 498E. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498F. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498G. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498H. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498I. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498J. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498K. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498L. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498M. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498N. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498O. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498P. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498Q. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498R. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498S. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498T. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498U. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498V. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498W. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498X. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498Y. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 498Z. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.