MEMORANDUM

TO: Craig Beyrouty
Dean, College of Agriculture and Natural Resources

FROM: Elizabeth Beise
Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Bachelor of Science in Animal Sciences (PCC Log No. 19021)

At its meeting on November 1, 2019, the Senate Committee on Programs, Curricula and Courses approved the proposal to modify the Bachelor of Science in Animal Sciences. A copy of the approved proposal is attached.

The change is effective Spring 2020. Please ensure that the change is fully described in the undergraduate program’s four-year plan (contact Lisa Kiely at lkiely@umd.edu for more information).

The program’s Undergraduate Catalog entry, specifically the course requirements section, will be updated automatically through the CourseLeaf system. The CourseLeaf system will keep the program modification in a pending state until February 1, 2020, when the 2020-2021 catalog is ready to be updated. If there is a need to modify the program before February 1, please contact cnsupport@umd.edu for assistance. Otherwise, the program will be available to be modified again, if necessary, starting in February.

MDC/
Enclosure

cc: Janna Bianchini, Chair, Senate PCC Committee
Barbara Gill, Office of Enrollment Management
Reka Montfort, University Senate
Huifang Pan, Division of Information Technology
Pam Phillips, Institutional Research, Planning & Assessment
Lae’l Hughes-Watkins, University Archives
Linda Yokoi, Office of the Registrar
Doug Roberts, Office of Undergraduate Studies
Joe Sullivan, College of Agriculture and Natural Resources
Chad Stahl, Department of Animal and Avian Sciences
Program Change Request

Date Submitted: 09/16/19 2:22 pm

Viewing: **124 : Animal Sciences Major**

Last approved: 08/14/19 1:50 pm

Last edit: 09/16/19 2:22 pm

Changes proposed by: Libby Dufour (libbyd)

Catalog Pages Using this Program

- Animal Sciences Major

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>Curriculum Change</th>
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<tbody>
<tr>
<td>Program Name</td>
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In Workflow

1. D-ANSC Curriculum Manager
2. D-ANSC PCC Chair
3. D-ANSC Chair
4. AGNR Curriculum Manager
5. AGNR PCC Chair
6. AGNR Dean
7. Academic Affairs Curriculum Manager
8. Senate PCC Chair
9. Provost Office
10. Undergraduate Catalog Manager

Approval Path

1. 09/16/19 2:25 pm
   Libby Dufour (libbyd): Approved for D-ANSC Curriculum Manager
2. 09/16/19 2:48 pm
   Sarah Balcom (sbalcom): Approved for D-ANSC PCC Chair
3. 09/16/19 2:59 pm
   Chad Stahl (chstahl): Approved for D-ANSC Chair
4. 09/16/19 4:12 pm
   Tyra Monnity (tgallman):
Animal Sciences Major

Program Status: Active
Effective Term: Spring 2020
Catalog Year: 2019-2020

Approved for AGNR Curriculum Manager
5. 10/09/19 4:57 pm
Joseph Sullivan (jsull): Approved for AGNR PCC Chair
6. 10/09/19 5:01 pm
Joseph Sullivan (jsull): Approved for AGNR Dean
7. 11/01/19 8:40 am
Michael Colson (mcolson): Approved for Academic Affairs Curriculum Manager
8. 11/01/19 9:30 am
Janna Bianchini (jcowb): Approved for Senate PCC Chair
9. 12/16/19 4:20 pm
Michael Colson (mcolson): Approved for Provost Office

History
1. Jul 29, 2019 by clmig-jwehrheim
2. Aug 14, 2019 by Jennifer Riggs (jriggs)
Program Level: Undergraduate Program

Program Type: Undergraduate Major

Delivery Method: On Campus

<table>
<thead>
<tr>
<th>Department</th>
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<tbody>
<tr>
<td>Animal &amp; Avian Sciences</td>
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<thead>
<tr>
<th>College</th>
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<tbody>
<tr>
<td>Agriculture and Natural Resources</td>
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</tbody>
</table>

Program/Major Code: 0104A, 0104C, 0104D, 0104E, 0104F

MHEC Inventory Program: Animal Sciences

CIP Code: HEGIS

MHEC Recognized Area(s) of Concentration:

Degree(s) Awarded:

<table>
<thead>
<tr>
<th>Degree Awarded</th>
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<tbody>
<tr>
<td>Bachelor of Science</td>
</tr>
</tbody>
</table>

If other, new degree award:

Proposal Contact

Proposal Summary

**Proposed changes are to Animal Care and Management (0104A) option only.**

**Summary of changes:**

1. Accept ANSC450 (Animal Breeding Plans) for ANSC Genetics requirement.
2. Accept ANSC270 (Animal Enterprise Management) and INAG204 (Agricultural Business Management) to satisfy the AREC306 (Farm Management) requirement.
3. Accept PLSC275 (Fundamentals of Agricultural Chemistry) as meeting the CHEM231 (Organic Chemistry) requirement.
Program and Catalog Information

Provide the catalog description of the proposed program. As part of the description, please indicate any areas of concentration or specializations that will be offered.

The Department of Animal and Avian Sciences provides a challenging program for academically talented students interested in the application of biology and technology to the care, management and study of domestic and aquatic animals. In addition to emphasizing the traditional farm species of dairy and beef cattle, sheep, swine and poultry, our program includes options for courses in equine science, animal biotechnology, and sciences which prepare students for veterinary or graduate school. Animal sciences majors explore a wide range of subjects - from fundamental biology to animal nutrition, physiology and genetics - while integrating science and economics into animal management. Courses offered by this department may be found under the following acronym: ANSC. Our department offers B.S., M.S., and Ph.D. degrees. Roughly one-third of our animal sciences seniors enter veterinary school, while others go on to graduate school. Our graduates also pursue a variety of careers such as research technicians, sales or marketing representatives, or animal producers.

Catalog Program Requirements:

Animal Sciences prepares students for veterinary school, graduate school, and careers in research, sales and marketing, biotechnology, aquaculture, and animal production. The curricula apply the principles of biology and technology to the care, management, and study of dairy and beef cattle, horses, fish, sheep, swine, and poultry. Students complete the Animal Sciences core courses and choose between two broad tracks: Animal Care and Management, for students interested in going directly into a career, or Sciences/Professional Option to prepare for admission to graduate, veterinary, pharmacy, nursing or medical school. Students can customize their program based on their area of interest (emphasis area) by selecting courses from that area to fulfill major requirements. Students pursuing the major should review the academic benchmarks established for this program. See www.4yearplans.umd.edu or visit the ANSC Program Requirements website. Students will be periodically reviewed to insure they are meeting benchmarks and progressing to the degree. Students who fall behind program benchmarks are subject to special advising requirements and other interventions.

Please note: there is a $50 per course fee for Animal Science Laboratory courses.

All undergraduates majoring in Animal Sciences must complete the following course requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC101</td>
<td>Principles of Animal Science</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ANSC103</td>
<td>and Principles of Animal Science Laboratory</td>
<td></td>
</tr>
<tr>
<td>ANSC204</td>
<td>Anatomy of Domestic Animals</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ANSC205</td>
<td>and Anatomy of Domestic Animals Laboratory</td>
<td></td>
</tr>
<tr>
<td>ANSC212</td>
<td>Applied Animal Physiology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ANSC214</td>
<td>and Applied Animal Physiology Laboratory</td>
<td></td>
</tr>
</tbody>
</table>
12/16/2019

Course | Title | Credits
---|---|---
ANSC314 | Comparative Animal Nutrition | 3
ANSC315 | Applied Animal Nutrition | 3
BSCI160 | Principles of Ecology and Evolution | 4
| & BSCI161 | and Principles of Ecology and Evolution Lab | |
BSCI170 | Principles of Molecular & Cellular Biology | 4
| & BSCI171 | and Principles of Molecular & Cellular Biology Laboratory | |
BSCI223 | General Microbiology | 4
CHEM131 | Chemistry I - Fundamentals of General Chemistry | 4
| & CHEM132 | and General Chemistry I Laboratory | |
MATH120 | Elementary Calculus I | 3-4
or MATH140 | Calculus I | |
AREC250 | Elements of Agricultural and Resource Economics | 3
or ECON200 | Principles of Microeconomics | |

Select one of the following specializations:
- Animal Care and Management
- Sciences & Combined AG and Vet Sci

Total Credits | 71-77

Specializations:

Animal Care and Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
</table>
| ANSC327 | Molecular and Quantitative Animal Genetics | 3
or ANSC450 | Animal Breeding Plans | |
ANSC446 | Physiology of Mammalian Reproduction | 3
ANSC447 | Physiology of Mammalian Reproduction Laboratory | 1
AREC306 | Farm Management and Sustainable Food Production | 3
or ANSC270 | Animal Enterprise Management | |
or INAG204 | Agricultural Business Management | |
CHEM231 | Organic Chemistry I | 3
or PLSC275 | Fundamentals of Agricultural Chemistry | |

Advanced ANSC Electives

Select 12 credits of the following: ANSC330 | Equine Science | 12
ANSC340 | Health Management of Animal Populations | |
ANSC359 | Internship Experience in Animal and Avian Sciences | |
### Course

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ANSC410</td>
<td>The Gut Microbiome and its Roles in Health and Disease</td>
<td></td>
</tr>
<tr>
<td>ANSC417</td>
<td>Regulatory Issues in Animal Care and Management</td>
<td></td>
</tr>
<tr>
<td>ANSC435</td>
<td>Experimental Embryology</td>
<td></td>
</tr>
<tr>
<td>ANSC437</td>
<td>Animal Biotechnology</td>
<td></td>
</tr>
<tr>
<td>ANSC440</td>
<td>Zoonotic Diseases and Control</td>
<td></td>
</tr>
<tr>
<td>ANSC443</td>
<td>Physiology of Lactation</td>
<td></td>
</tr>
<tr>
<td>ANSC444</td>
<td>Domestic Animal Endocrinology</td>
<td></td>
</tr>
<tr>
<td>ANSC450</td>
<td>Animal Breeding Plans</td>
<td></td>
</tr>
<tr>
<td>ANSC452</td>
<td>Avian Physiology</td>
<td></td>
</tr>
<tr>
<td>ANSC453</td>
<td>Animal Welfare and Bioethics</td>
<td></td>
</tr>
<tr>
<td>ANSC455</td>
<td>Applied Animal Behavior</td>
<td></td>
</tr>
<tr>
<td>ANSC460</td>
<td>Comparative Vertebrate Immunology</td>
<td></td>
</tr>
<tr>
<td>ANSC497</td>
<td>Animal Biotechnology Recombinant DNA Laboratory</td>
<td></td>
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</tbody>
</table>

### Management Courses

Select 9 credits of the following: **9**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ANSC220</td>
<td>Livestock Management</td>
</tr>
<tr>
<td>ANSC232</td>
<td>Horse Management</td>
</tr>
<tr>
<td>ANSC237</td>
<td>Equine Reproductive Management</td>
</tr>
<tr>
<td>ANSC242</td>
<td>Dairy Cattle Management</td>
</tr>
<tr>
<td>ANSC250</td>
<td>Companion Animal Care and Management</td>
</tr>
<tr>
<td>ANSC255</td>
<td>Introduction to Aquaculture</td>
</tr>
<tr>
<td>ANSC260</td>
<td>Laboratory Animal Management</td>
</tr>
<tr>
<td>ANSC262</td>
<td>Commercial Poultry Management</td>
</tr>
<tr>
<td>ANSC282</td>
<td>Grazing Animal Management</td>
</tr>
</tbody>
</table>

**Total Credits: 34**

### Science/Professional & Combined Ag-Veterinary Medicine

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC327</td>
<td>Molecular and Quantitative Animal Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BCHM463</td>
<td>Biochemistry of Physiology</td>
<td>3-4</td>
</tr>
<tr>
<td>or BSCI330</td>
<td>Cell Biology and Physiology</td>
<td></td>
</tr>
<tr>
<td>CHEM231</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CHEM232</td>
<td>and Organic Chemistry Laboratory I</td>
<td></td>
</tr>
<tr>
<td>CHEM241</td>
<td>Organic Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CHEM242</td>
<td>and Organic Chemistry Laboratory II</td>
<td></td>
</tr>
<tr>
<td>CHEM271</td>
<td>General Chemistry and Energetics</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CHEM272</td>
<td>and General Bioanalytical Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Credits</td>
</tr>
<tr>
<td>----------</td>
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</tr>
<tr>
<td>PHYS121</td>
<td>Fundamentals of Physics I</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS131</td>
<td>Fundamentals of Physics for Life Sciences I</td>
<td></td>
</tr>
<tr>
<td>PHYS122</td>
<td>Fundamentals of Physics II</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS132</td>
<td>Fundamentals of Physics for Life Sciences II</td>
<td></td>
</tr>
</tbody>
</table>

Advanced ANSC Electives
Plus take 9 credits of the following: 9

- ANSC330  Equine Science
- ANSC340  Health Management of Animal Populations
- ANSC359  Internship Experience in Animal and Avian Sciences
- ANSC410  The Gut Microbiome and its Roles in Health and Disease
- ANSC417  Regulatory Issues in Animal Care and Management
- ANSC435  Experimental Embryology
- ANSC437  Animal Biotechnology
- ANSC440  Zoonotic Diseases and Control
- ANSC443  Physiology of Lactation
- ANSC444  Domestic Animal Endocrinology
- ANSC446  Physiology of Mammalian Reproduction
- ANSC447  Physiology of Mammalian Reproduction Laboratory
- ANSC450  Animal Breeding Plans
- ANSC452  Avian Physiology
- ANSC453  Animal Welfare and Bioethics
- ANSC455  Applied Animal Behavior
- ANSC460  Comparative Vertebrate Immunology
- ANSC497  Animal Biotechnology Recombinant DNA Laboratory

Management Courses
Select 3 credits of the following: 3

- ANSC220  Livestock Management
- ANSC232  Horse Management
- ANSC237  Equine Reproductive Management
- ANSC242  Dairy Cattle Management
- ANSC250  Companion Animal Care and Management
- ANSC255  Introduction to Aquaculture
- ANSC260  Laboratory Animal Management
- ANSC262  Commercial Poultry Management
- ANSC282  Grazing Animal Management

Total Credits 38-39

*A complete listing of all currently approved Management and Advanced ANSC Elective courses is available from our ANSC Course Listing page.*

Other Requirements for the Major
Animal sciences majors select one of two options to guide their coursework. Program requirements for all options are available on our website, along with a list of all ANSC courses and when they are offered.

**Animal Care & Management (0104A)** - Is designed for students whose career plans include animal management, production and the marketing of animal products. The curriculum provides basic courses in genetics, nutrition, physiology and reproduction while allowing students to focus on the management of one particular livestock species. You will be encouraged to supplement academic work with practical experience by completing an internship. Dairy science students, for example, intern at local farms where they participate in decisions about breeding, feeding, health practices, milk production and other aspects of herd management. This option will prepare you for ownership or management positions with dairy, livestock or poultry production enterprises; positions with marketing and processing organizations; breed associations; and positions in agribusiness fields such as sales of feed, pharmaceutical products and agricultural equipment. Graduates also work with state and federal agencies.

**Science/Professional (0104E)** - Prepares students for admission to veterinary or medical schools and/or graduate school. Graduate school study can open the door to an exciting research career in specialty areas of animal or biological sciences such as genetics, nutrition, physiology or cell biology. The curriculum emphasizes advanced courses in the biological and physical sciences and includes all the pre-veterinary and pre-medicine requirements.

**Combined Ag & Vet Sci (1299D)** - A combined degree program is available to students who gain admission to veterinary school prior to completing their bachelor’s degree. College of Agriculture and Natural Resources students who have completed an associate degree at a community college with a cumulative GPA of 2.0 and a 2.0 cumulative GPA in all major courses, and have completed at least ninety hours of coursework toward a bachelor of science degree upon successful completion of at least thirty semester hours in an accredited college of veterinary medicine. Early planning with your advisor is encouraged if you choose this option.

**Minimum Grade Policy:**

ANSC has a minimum grade policy which states that ANSC students must earn a “C-“ or better in all major required courses, including ANSC courses and required supporting courses in other departments. Students must also have both a cumulative GPA of at least 2.0 and a 2.0 cumulative GPA in all major requirements in order to graduate. More information on this policy is available on the ANSC Minimum Grade Policy page.

Sample plan. Provide a term by term sample plan that shows how a hypothetical student would progress through the program to completion. It should be clear the length of time it will take for a typical student to graduate. For undergraduate programs, this should be the four-year plan.

**Sample course plan that reflects these curriculum changes available here:** https://ansc.umd.edu/sites/ansc.umd.edu/files/_images/uploaded/0104A%204-year%20plan%20Gen%20Ed%20Fall%2018.pdf
Use the space below for any additional comments on the courses or other requirements selected for the revised curriculum. Typical comments may be clarifications of why certain courses are being replaced or added.

These changes have all been approved by our faculty, but some of these courses (most notably PLSC275 and INAG204) were initially not guaranteed to be offered long term, so we waited to formally submit the request to change the curriculum until we were sure the courses had been approved by VPAC and would be regularly available.

Additional justification for each change included in Program Modification Information below.

List the intended student learning outcomes. In an attachment, provide the plan for assessing these outcomes.

Learning Outcomes

Articulate the basic housing, husbandry, dietary, and behavioral needs of the common domestic species.

Safely handle horses, sheep, cows, pigs, and chickens.

Select, understand, and critically evaluate scientific studies in animal sciences disciplines.

Apply animal science knowledge to the creation of animal management programs (husbandry, health, reproduction, nutrition, etc).

Program Modification Information

Description and Rationale for Modifications.

We are requesting three curriculum changes to the Animal Care & Management option (0104A). All three changes are to give students greater flexibility in the courses they can use to satisfy our requirements, both in terms of scheduling but also (in the case of our Genetics and Chemistry requirements) giving them the option of taking other courses that better serve their educational needs. In all three proposed changes, students are still able to take the original course from the curriculum to meet the requirement.

1) Curriculum Change: Accept ANSC450 (Animal Breeding Plans) for ANSC Genetics requirement. Students can still choose to take ANSC327 (Molecular and Quantitative Animal Genetics - original genetics requirement for ANSC), but can also choose to take ANSC450 instead.

Justification: Many students in the Animal Care & Management option are looking at industry jobs where an applied animal breeding course (that includes genetic basics) is more helpful towards their career goals. Students with an interest in career that would benefit more from molecular genetics can still take that course.
2) Curriculum Change: Accept ANSC270 (Animal Enterprise Management) and INAG204 (Agricultural Business Management) to satisfy the AREC306 (Farm Management) requirement.

Justification: When AREC306 became an approved SP course under seat restrictions, it has become much more difficult for our students to get into, especially since it is only offered in the Fall semester. We created ANSC270 specifically as an alternative to AREC306, but can only offer it every other fall. INAG204 also focuses on similar content and is offered in the spring, making it another viable alternative to allow students to stay on track with their requirements. All courses cover the basic principles of agricultural business management we deem important for our curriculum.

3) Curriculum change: Accept PLSC275 (Fundamentals of Agricultural Chemistry) as meeting the CHEM231 (Organic Chemistry) requirement.

Justification: ANSC students need the basic principles of organic chemistry to prepare them for our 300-level nutrition courses. We previously accepted both CHEM104 and CHEM105 as meeting those requirements, which the Chemistry department no longer offers. The PLSC department created PLSC275 to fill the gap created for their students as well as ours by the loss of those CHEM courses. PLSC275 covers the basics of organic and biochemistry ANSC students need for our nutrition courses. Students interested in pursuing careers that may require more Chemistry still have the option of completing CHEM231 for the requirement instead.

For new or modified courses, please provide the course catalog information (credits, description, prerequisites, etc.). Suffixied "Selected" or "Special" topics courses should be avoided. New courses and course modifications must be submitted through the course approval process at https://courseleaf.umd.edu/courseadmin. You may submit individual course changes through the course approval process concurrently with the program proposal; however, the course change approvals may be held until the program proposal is approved.

All courses being added as meeting the requirement have been submitted through VPAC and are approved courses included in the Course Catalog.

Impact on current students. It should be specifically acknowledged that students enrolled in the program prior to the effective date of any curriculum change may complete their program under the old requirements if they wish. The courses required must remain available, or suitable substitutions specifically designated.

In all three proposed changes, students are still able to take the original course from the curriculum to meet the requirement, so the only impact on students is to give them increased flexibility in meeting their requirements.
Linked Programs

Indicate in the space below all programs to which this program is formally linked (e.g., approved combined bachelor's/master's programs, dual master's programs, or joint-programs with other universities). If the proposed modification will affect the linked program, provide as an attachment the new curriculum for each arrangement and provide supporting correspondence from the director of the linked program.

Describe any selective admissions policy or special criteria for students interested in this program.

Relationship to Other Units or Institutions

If a required or recommended course is offered by another department, discuss how the additional students will not unduly burden that department’s faculty and resources. Discuss any other potential impacts on another department, such as academic content that may significantly overlap with existing programs. Use space below for any comments. Otherwise, attach supporting correspondence.

Support for Curriculum Change 2:
The IAA specifically asked us if we would accept this course as meeting our requirement, so support this being a part of our curriculum. Meredith Epstein (mbepste@umd.edu) is the contact person who initiated the request. PDF of her email requesting we accept the course for our major attached.

Support for Curriculum Change 3:
Chris Walsh (cswalsh@umd.edu) in PLSC actively engaged ANSC participation and support in developing the course so that it would meet the needs of ANSC students as well as PLSC students, so PLSC supported the course being allowed to fulfill a requirement for ANSC majors. Word document of conversations had back when PLSC275 was originally proposed (2011) that show the course was collaboratively created to meet the needs of both ANSC and PLSC students, and that PLSC supports our majors being in the course.

Accreditation and Licensure. Will the program need to be accredited? If so, indicate the accrediting agency. Also, indicate if students will expect to be licensed or certified in order to engage in or be successful in the program’s target occupation.
Describe any cooperative arrangements with other institutions or organizations that will be important for the success of this program.

Supporting Documents

Attachments
ANSCEAcceptingINAG204.pdf
PLSC275creation.docx

Administrative
Documents

Reviewer
Comments

Key: 124