APPROVED BY SENATE 02/10/2020

New Proposal

Date Submitted: 09/20/19 9:02 pm

Viewing: **: JP: Animal Sciences**

BS/MANSC

Last edit: 11/20/19 9:08 am

Changes proposed by: Sandra Rodriguez-Zas

In Workflow

1. **U Program Review**
2. **1538 Head**
3. **KL Committee Chair**
4. **KL Dean**
5. **University Librarian**
6. **Grad_College**
7. **Provost**
8. **Senate EPC**
9. Senate
10. U Senate Conf
11. Board of Trustees
12. IBHE
13. DMI

Approval Path

1. 09/23/19 9:05 am Deb Forgacs (dforgacs): Approved for U Program Review
2. 09/23/19 1:09 pm Rodney W. Johnson (rwjohn): Approved for 1538 Head
3. 10/09/19 1:17 pm Anthony Yannarell (acyann): Approved for KL Committee Chair
4. 10/10/19 12:57 pm Anna Ball (aball): Approved for KL Dean
5. 10/10/19 1:02 pm John Wilkin (jpwilkin):

Approved for University Librarian
6. 11/19/19 7:05 pm Allison McKinney (agrindly): Approved for Grad_College
7. 11/19/19 7:18 pm Kathy Martensen (kmartens): Approved for Provost

Proposal Type

Proposal Type:
Joint Program (ex. Master of Public Health & PhD. in Community Health)

Proposal Title:

if this proposal is one piece of a multi-element change please include the other impacted programs here. *example: A BS revision with multiple concentration revisions*

Establish joint program in the Department of Animal Sciences for the BS/MANSC

Official Program Name	JP: Animal Sciences BS/MANSC
Banner/Codebook Name	

Program Code:

Major Code	Minor Code	Conc Code	Degree Code

EP Control Number	EP.20.52
Senate Approval Date	
Senate Conference Approval Date	

BOT Approval Date

IBHE Approval Date

Effective Date:

Effective Catalog Term: Fall 2020

Sponsor College: Agr, Consumer, & Env Sciences

Sponsor Department: Animal Sciences

Sponsor Name: Sandra Rodriguez Zas

Sponsor Email: rodrgzzs@illinois.edu

College Contact: Brianna Gregg

College Contact Email: bjgray2@illinois.edu

Identify the existing programs to be joined:

Corresponding Program(s)
Animal Sciences, BS
Animal Sciences, MANSC

Academic Level: Graduate
Undergraduate

Program Description and Justification

Provide a ***brief*** description and justification of the program, including highlights of the program objectives, and the careers, occupations, or further educational opportunities for which the program will prepare graduates, when appropriate.

The Department of Animal Sciences petitions a joint degree program integrating the Bachelor of Science (BS) in Animal Sciences and the non-thesis Master of Animal Sciences (MANSC) programs. Students will receive a BS and MANSC degrees upon completion of 146 credit hours. These credit hours encompass the 126 credit hours required for the established B.S. degree including a minimum 40 hours of 300- or 400-level courses as required by the Illinois Board of Higher Education (IBHE) plus the 32 credit hours required for the established MANSC degree minus 12 graduate-level (400- or 500-level) credit hours that count towards both degrees. The job opportunities for animal scientists are expected to increase more than 8% between 2012 and 2022. The 4+1 program will prepare our graduates with advanced animal sciences background in an efficient timeline to be competitive in the labor market.
The proposed 4+1 BS/MANSC program advances the land grant mission of the University of Illinois (UofI), College of ACES and Department of Animal Sciences, strengthens the competitiveness of the corresponding academic units, addresses industry workforce needs, and enhances the likelihood that our graduates will secure high-paying and high-ranking jobs in the areas of food production, health and well-being, environmental conservation, and sustainability.

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Institutional Context

University of Illinois at Urbana-Champaign

Describe the historical and university context of the program's development. Include a short summary of any existing program(s) upon which this program will be built.

Explain the nature and degree of overlap with existing programs and, if such overlap exists, document consultation with the impacted program's home department(s).

The proposed joint Animal Sciences BS/MANSC program addresses needs, capitalizes on institutional resources, and advances the prospects of UofI graduates because this 4+1 program:
* Enables UofI to remain competitive in the recruitment, retention, graduation, and placement of students in the field of Animal Sciences. Departments of Animal Sciences at peer institutions including North Carolina State University and Iowa State University already offer accelerated joint programs akin to that proposed.
* Addresses the need of the agricultural, biomedical, and companion animal industries and government agencies for a workforce that has advanced preparation in state-of-the-art animal science concepts and approaches. The proposed program will enable graduates to rapidly apply their cutting-edge knowledge in the areas of food production, health and well-being, and environmental conservation and sustainability. The stand-alone MANSC program started in 2019 and already has 10 enrolled students, the majority of whom have B.S. degrees from other institutions.
* Answers the students' demand for accelerated joint programs that support efficient career preparation paths. Students in the proposed 4+1 program will effectively use the departmental resources, faculty expertise, curricula, and hands-on research experiences in the areas of behavior, bioinformatics, genetics, genomics, immunology, microbiology, meat science and muscle biology, management, non-ruminant and ruminant nutrition, and reproductive physiology among others.
* Grants animal science students additional opportunities to take advantage of the 55 graduate-level (400- or 500-level) courses (http://catalog.illinois.edu/) offered by the Department of Animal Sciences. The joint program will also grant the students more opportunities for research and experiential learning. During a 4-year period, a typical animal sciences undergraduate student enrolls in less than half of the Animal Sciences courses available.
* Builds on the breadth and depth of the training that animal sciences undergraduate students receive by recognizing 12 graduate-level (400- or 500 level) credit hours that are in turn, applied towards a MANSC degree.

University of Illinois

Briefly describe how this program will support the University's mission, focus and/or current priorities. Demonstrate the program's consistency with and centrality to that mission.

The proposed 4+1 BS/MANSC program will:
* Support the land grant mission of UofI by offering a demanded service: a high quality preparation in Animal Sciences in an accelerated format that enables students to graduate with BS and MANSC degrees within five years of admission.
* Strengthen the competitiveness of the Department of Animal Sciences at UofI by offering a joint undergraduate and graduate degree at par with Animal Sciences departments at peer institutions.
* Address industry workforce needs and enhance the likelihood that UofI graduates secure high-paying and high-ranking jobs in agricultural, biomedical, and companion animal industries in the areas of food production and safety, health and well-being, environmental conservation, and sustainability.

State of Illinois

Indicate which of the following goals of the Illinois Board of Higher Education's Strategic Initiative are supported by this program: (choose all that apply)

College Affordability - ensure college affordability for students, families, and taxpayers.
Educational Attainment - increase educational attainment to match the best-performing states.
High Quality Credentials to Meet Economic Demand - Increase the number of high-quality post-secondary credentials to meet the demands of the economy and an increasingly global society.

Describe how the proposed program supports these goals.

The proposed program supports the goal of educational attainment by offering continued training and experiential learning opportunities advised by faculty experts throughout the undergraduate + graduate-level years of the program.
The proposed program support college affordability because the students in the program can use 12 credit hours from their baccalaureate degree towards the graduate-level requirements. Students will be assessed the undergraduate tuition rate and fees that apply to majors in Animal Sciences prior to being admitted by The Graduate College of UofI, and will be assessed the graduate tuition rate that applies to students in the Master of Animal Sciences program thereafter.

The proposed programs support high quality credentials to meet economic demand because the degree requirements for graduation offer strong preparation to join the industry workforce.

Admission Requirements

Desired Admissions Term	Fall 2020

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

* Students enrolled in the proposed joint program will be able to apply a maximum of 12 graduate-level (400- or 500-level) credit hours from their BS degree towards the MANSC degree requirements. The 4+1 program will permit students to graduate with B.S. and MANSC degrees in as early as 5 years. Credit hours from the BS degree that are applied towards a second major, a minor or a transcriptable certificate cannot be used towards the MANSC degree. TOEFL requirements follow the Graduate College requirements. Applicants are expected to submit GRE scores.
* Students enrolled in the BS program that have completed at least 60 credit hours of degree requirements and that have a minimum GPA of 3.0 are eligible to apply and be admitted to this program. Students that have a GPA above 2.75 may be admitted on probationary status. The Department of Animal Sciences will support the application to the MANSC program of the students in this joint program that have completed the required 126 credit hours towards a BS degree (including a minimum 40 hours of 300- or 400- level courses) and that have a minimum GPA of 3.0. Up to 12 graduate-level (400- or 500-level) credit hours from the BS program will count towards the 32 credit-hour requirement of the MANSC program.
* The existing stand-alone MANSC program has a 6 credit hour requirement of an independent research project (ANSC 592/593). This requirement aims to address potential gaps in hands-on research experiences that undergraduate students from other institutions may have because the majority of the UofI students in the Animal Sciences BS program have either for-credit (ANSC 398) or non-transcripted research experiences. Students in the proposed joint program have the option to substitute, partially or completely, the 6 credit hours of independent research required in the stand-alone MANSC program for graduate-level (400- or 500-level) coursework. This substitution must be petitioned and approved by the departmental faculty committee that also evaluates applications to the joint program. Substitutions will be granted to students that present evidence of research experiences comparable to that expected of MANSC graduates.

Describe how critical academic functions such as admissions and student advising are managed.

* A committee of Animal Sciences faculty will review the applications and determine admissions.
* The Department of Animal Sciences directors of graduate and undergraduate programs together with faulty members of the joint program committee will implement, oversee and regularly evaluate the progress of the program.
* All students in the joint program will have an undergraduate and a graduate studies advisor. Their joint advising will ensure the student receives guidance on academic activities that support the effective completion of the joint program requirements and target the students' career goals. Students pursuing independent studies credit hours will be advised by the faculty member overseeing the research project.

Enrollment

Number of Students in Program (estimate)

Year One Estimate	5	5th Year Estimate (or when fully implemented)
15		

Estimated Annual Number of Degrees Awarded

Year One Estimate	5 (3 years after admission)	5th Year Estimate (or when fully implemented)
15		

Delivery Method

This program is available:
Face-to-Face

Budget

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?
No

Additional Budget Information
The proposed program builds on existing undergraduate and graduate programs. No additional costs are anticipated because the existing programs and most of the animal sciences courses are at under-capacity. Students will be assessed tuition charges corresponding to the BS first, and once admitted by the Graduate College, tuition charges will correspond to those of the MANSC program. No campus or external resources will be requested.
Students in the proposed program will be enrolled in the existing BS and MANSC programs and will take existing animal sciences courses (please refer to Appendix). The existing programs and most of the animal sciences courses are at under-capacity. The proposed joint program and the expected enrollment will make effective use of the resources in place. Students pursuing independent projects will benefit from ongoing researcher projects directed by animal sciences faculty. No new courses are proposed.

Attach File(s)

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?
No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

The progression of academic resources and degree demands evidenced in the departmental profiles (https://dmi.illinois.edu) support the expected enrollment in the proposed joint programs. In recent years, 7 junior tenure-track faculty and 3 specialized faculty have joined the Department of Animal Sciences, and all these positions have teaching responsibilities. Similar instructional hire trends are expected in the near future.
Since 2014, the number of undergraduate students in Animal Sciences has oscillated between 534 students (2014-2015) and 495 students (2017-2018) while the number of graduate students (master and doctoral levels) has oscillated between 99 students (2014-2015) and 89 students (2017-2016). Similar patterns are observed in the number of BS degrees ranging from 157 degrees (2015-2016) to 111 degrees (2018-2019) meanwhile the number of master's degrees ranged between 14 degrees (2014-2015) and 23 degrees (2017-2018). The number of BS degrees per faculty FTE has oscillated between 4.7 (2015-2016) and 3.4 (2018-2019) whereas the number of master's degrees per faculty FTE is 0.7 at present. The prior indicators demonstrate that the present conditions enable the Department of Animal Sciences to support the higher BS and MANSC enrollment numbers that are anticipated from the joint programs with no or minimal resource implications.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

Please refer to the Appendix.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does this new program/proposed change result in the replacement of another program?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

No

Financial Resources

How does the unit intend to financially support this proposal?

The proposal integrates programs that already in place within the Department of Animal Sciences. The instructional resources are not at capacity and the education and mentoring of students in the proposed self-supported program will not result in additional fixed costs. Once the program is established, a potential minor increase in variable costs associated with additional teaching assistant support can be defrayed with income from the self-supported MANSC degree.

Will the unit need to seek campus or other external resources?

No

Attach letters of support

Will an existing tuition rate be used or continue to be used for this program?

Yes

Market Demand

What market indicators are driving this proposal? If similar programs exist in the state, describe how this program offers a unique opportunity for students:

No similar program exist in the state. However, the Departments of Animal Sciences at peer institutions including North Carolina State University and Iowa State University already offer accelerated joint programs akin to that proposed. The proposed program will enable UofI to remain competitive in the recruitment, retention, graduation, and placement of students in the field of Animal Sciences.
Animal scientist employment was estimated at approximately more than 1.2 million positions (U.S. Bureau of Labor Statistics, 2015). This metric includes animal scientists, animal breeders, agricultural managers, non-farm animal caretakers, laboratory animal caretakers, zoologists, and wildlife biologists and excludes veterinarians. The job opportunities for animal scientists alone are expected to increase more than 8% between 2012 and 2022. Post-secondary animal science education and non-farm animal caretakers will see even higher increases during the same 10-year period.

What type of employment outlook should these graduates expect? Explain how the program will meet the needs of regional and state employers, including any state agencies, industries, research centers, or other educational institutions that expressly encourage the program's development.

The more than 1.2 million positions associated with animal sciences disciplines include biotechnology researchers, animal breeders, agricultural managers, non-farm animal caretakers, laboratory animal caretakers, zoologists, and wildlife biologists and excludes veterinarians. The job opportunities for animal scientists alone are expected to increase more than 8% between 2012 and 2022. Post-secondary animal science education and non-farm animal caretakers will see even higher increases during the same 10-year period.

What resources will be provided to assist students with job placement?

Comprehensive assistance with job placement is already offered to undergraduate and graduate students and these resources will be available to the students in the proposed program. These resources include invited departmental seminar speakers that represent various industry sectors. Interaction with representatives from industry is also common for animal sciences students that participate in research projects funded by state, country and global industry partnerships. The Department of Animal Sciences regularly communicates job opportunities (an average of 3/week) to graduate students through email lists. Animal science students are also encouraged to participate in the career fairs offered by the College of ACES.

If letters of support are available attach them here:

Program Regulation

Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable.

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning.

Not applicable.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

For new programs, attach Program of Study: ANSC4+1BSMANSCacademiccatalogrev2_sep172019.docx

Catalog Page Text

Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.

The joint BS/MANSC program in Animal Sciences integrates a baccalaureate (BS) in Animal Sciences preparation with a non-thesis Master of Animal Sciences (MANSC) preparation. Students enrolled in the BS in Animal Sciences program that have completed a minimum of 60 credit hours of degree requirements and that have a minimum GPA of 3.0 are eligible to apply and be admitted to this program. Students that have a GPA above 2.75 may be admitted on probationary status. The Department of Animal Sciences will support the application to the MANSC program of the students in this joint program that have completed the required 126 credit hours towards a BS in Animal Sciences degree (including a minimum of 40 hours of 300- or 400- level courses) and that have a minimum GPA of 3.0. Up to 12 graduate-level (400- or 500-level) credit hours from the BS program will count towards the 32 credit-hour requirement of the MANSC program.

Statement for Programs of Study Catalog

The joint BS/MANSC program in Animal Sciences integrates a baccalaureate (BS) in Animal Sciences preparation with a non-thesis Master of Animal Sciences (MANSC) preparation. Students enrolled in the BS in Animal Sciences program that have completed at least 60 credit hours of degree requirements and that have a minimum GPA of 3.0 are eligible to apply and be admitted to this program. Students that have a GPA above 2.75 may be admitted on probationary status. The Department of Animal Sciences will support the application of the students in the proposed program, that have completed the required 126 credit hours towards a BS in Animal Sciences degree (including a minimum of 40 hours of 300- or 400- level courses) and that have a minimum GPA of 3.0, to the MANSC program. Up to 12 graduate-level (400- or 500-level) credit hours from the BS program will count towards the 32 credit-hour requirement of the MANSC program.
Please refer to the Academic Catalog entries for the BS and MANSC programs in Animal Sciences for the requirements of each program component.

EP Documentation

Attach
Rollback/Approval
Notices

DMI Documentation

Attach Final
Approval Notices

Attached
Document

Justification for
this request

Program Reviewer
Comments

Deb Forgacs (dforgacs) (09/16/19 1:59 pm): Rollback: review proposal title and separate programs.

Deb Forgacs (dforgacs) (09/20/19 8:37 am): Rollback: proposer request.

Key: 881

Academic Catalog program of study entries (BS, and MANSC)

Animal Sciences: Companion & Equine Science, BS

Degree Requirements for the degree of Bachelor of Science Major in Animal Sciences, Companion & Equine Science Concentration

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Prescribed Courses including Campus General Education

Code	Title	Hours
Composition I and Speech		
RHET 105	Writing and Research (or equivalent) (see college Composition I requirement)	4
CMN 101	Public Speaking	3
Advanced Composition		
Select from campus approved list.		3-4
Cultural Studies		
Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists.		9
Foreign Language		
Coursework at or above the third level is required for graduation.		
Quantitative Reasoning I		
Select one of the following:		4-5
MATH 220	Calculus	4
MATH 221	Calculus I	5
MATH 234	Calculus for Business I	4
Quantitative Reasoning II		
Select one of the following:		3-4
ACE 261	Applied Statistical Methods	4
CPSC 241	Intro to Applied Statistics	3

Code	Title	Hours
ECON 202	Economic Statistics I	3
PSYC 235	Intro to Statistics	3
STAT 100	Statistics	3
SOC 280	Intro to Social Statistics	4
Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	5
Humanities and the Arts		
Courses selected from campus approved list		6
Social Sciences		
ECON 102	Microeconomic Principles	3
or ACE 100	Agr Cons and Resource Econ	
Additional social or behavioral science course; cannot be an economics course.		3-4
ACES Required		
ACES 101	Contemporary Issues in ACES	2
Animal Sciences Required		
ANSC 100	Intro to Animal Sciences	4
ANSC 101	Contemporary Animal Issues	3
ANSC 103	Working With Farm Animals	2
ANSC 221	Cells, Metabolism and Genetics	3
ANSC 222	Anatomy and Physiology	3

Code	Title	Hours
ANSC 223	Animal Nutrition	3
ANSC 224	Animal Reproduction and Growth	4
ANSC 298	Undergraduate Seminar	1
ANSC 398	UG Experiential Learning [1]	1
ANSC 498	Integrating Animal Sciences	2
Companion Animal and Equine Science Concentration Required		
Choose one group: [1]		6
ANSC 250 & ANSC 307	Companion Animals in Society and Companion Animal Management	3&3
or		
ANSC 206 & ANSC 306	Horse Management and Equine Science	3&3
Select two of the following Applied Sciences courses: [1]		6
ANSC 201	Principles of Dairy Production	3
ANSC 204	Intro Dairy Cattle Evaluation	2
ANSC 205	World Animal Resources	3
ANSC 206	Horse Management [1]	3
ANSC 211	Breeding Animal Evaluation	3
ANSC 219	Meat Technology	3
ANSC 250	Companion Animals in Society [1]	3
ANSC 301	Food Animal Production, Management, and Evaluation	3
ANSC 305	Human Animal Interactions	3
ANSC 306	Equine Science	3
ANSC 307	Companion Animal Management [1]	3

Code	Title	Hours
ANSC 309	Meat Production and Marketing	2
ANSC 310	Meat Selection and Grading	3
ANSC 312	Advanced Livestock Evaluation	3
ANSC 313	Horse Appraisal	2
ANSC 314	Adv Dairy Cattle Evaluation	2
ANSC 322	Livestock Feeds and Feeding	3
ANSC 370	Companion Animal Policy	3
ANSC 400	Dairy Herd Management	3
ANSC 401	Beef Production	3
ANSC 402	Sheep Production	3
ANSC 403	Pork Production	3
ANSC 404	Poultry Science	3
ANSC 405	Advanced Dairy Management	2
ANSC 407	Animal Shelter Management	3
ANSC 424	Pet Food & Feed Manufacturing	3
ANSC 435	Milk Quality and Udder Health	2
ANSC 437	Adv Reproductive Management	2
ANSC 471	ANSC Leaders & Entrepreneurs	3
Select two of the following Basic Sciences courses:		6
ANSC 251	Epidemics and Infectious Diseases	3
ANSC 331	Biology of Reproduction	2-4
ANSC 350	Cellular Metabolism in Animals	3
ANSC 363	Behavior of Domestic Animals	3

Code	Title	Hours
ANSC 366	Animal Behavior	3
ANSC 406	Zoo Animal Conservation Sci	3
ANSC 409	Meat Science	3
ANSC 420	Ruminant Nutrition	3
ANSC 421	Minerals and Vitamins	3
ANSC 422	Companion Animal Nutrition	3
ANSC 431	Advanced Reproductive Biology	3
ANSC 438	Lactation Biology	4
ANSC 440	Applied Statistical Methods I	4
ANSC 441	Human Genetics	3-4
ANSC 444	Applied Animal Genetics	3
ANSC 445	Statistical Methods	4
ANSC 446	Population Genetics	3-4
ANSC 447	Advanced Genetics and Genomics	4
ANSC 448	Math Modeling in Life Sciences	3-4
ANSC 449	Biological Modeling	3-4
ANSC 450	Comparative Immunobiology	4
ANSC 451	Microbes and the Anim Indust	3
ANSC 452	Animal Growth and Development	3-4
ANSC 453	Stem Cell Biology	3-4
ANSC 467	Applied Animal Ecology	3
ANSC 509	Muscle Biology	2
ANSC 510	Science of Animal Well-Being	

Code	Title	Hours
ANSC 520	Protein and Energy Nutrition	3
ANSC 521	Regulation of Metabolism	3
ANSC 522	Advanced Ruminant Nutrition	3
ANSC 523	Techniques in Animal Nutrition	3
ANSC 524	Nonruminant Nutrition Concepts	2
ANSC 525	Topics in Nutrition Research	1
ANSC 526	Adv Companion Animal Nutrition	3
ANSC 533	Repro Physiology Lab Methods	1-3
ANSC 541	Regression Analysis	5
ANSC 542	Applied Bioinformatics	4
ANSC 543	Bioinformatics	4
ANSC 545	Statistical Genomics	3-4
ANSC 554	Immunobiological Methods	3
ANSC 561	Animal Stress Physiology	2
Additional elective courses must be completed to yield at least 126 total Hours for graduation.		25-29
Total Hours		**126**

The required 126 hours must include a minimum of 40 hours of 300- and 400-level courses

or

Animal Sciences: Food Animal Production & Management, BS

Degree Requirements for the degree of Bachelor of Science Major in Animal Sciences, Food Animal Production & Management concentration

Code	Title	Hours
Composition I and Speech		
RHET 105	Writing and Research (or equivalent) (see college Composition I requirement)	4
CMN 101	Public Speaking	3

Code	Title	Hours
Advanced Composition		
Select from campus approved list.		3-4
Cultural Studies		
Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists.		9
Foreign Language		
Coursework at or above the third level is required for graduation.		
Quantitative Reasoning I		
Select one of the following:		4-5
MATH 220	Calculus	4
MATH 221	Calculus I	5
MATH 234	Calculus for Business I	4
Quantitative Reasoning II		
Select one of the following:		3-4
ACE 261	Applied Statistical Methods	4
CPSC 241	Intro to Applied Statistics	3
ECON 202	Economic Statistics I	3
PSYC 235	Intro to Statistics	3
STAT 100	Statistics	3
SOC 280	Intro to Social Statistics	4
Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	5
Humanities and the Arts		
Courses selected from campus approved list		6
Social Sciences		
ECON 102 or ACE 100	Microeconomic Principles Agr Cons and Resource Econ	3
Additional social or behavioral science course; cannot be an economics course.		3-4
ACES Required		
ACES 101	Contemporary Issues in ACES	2
Animal Sciences Required		
ANSC 100	Intro to Animal Sciences	4

Code	Title	Hours
ANSC 101	Contemporary Animal Issues	3
ANSC 103	Working With Farm Animals	2
ANSC 221	Cells, Metabolism and Genetics	3
ANSC 222	Anatomy and Physiology	3
ANSC 223	Animal Nutrition	3
ANSC 224	Animal Reproduction and Growth	4
ANSC 298	Undergraduate Seminar	1
ANSC 398	UG Experiential Learning [1]	1
ANSC 498	Integrating Animal Sciences	2
Food Animal Production and Management Concentration Required		
Select four of the following Applied Sciences courses:		12
ANSC 201	Principles of Dairy Production	3
ANSC 204	Intro Dairy Cattle Evaluation	2
ANSC 205	World Animal Resources	3
ANSC 206	Horse Management	3
ANSC 211	Breeding Animal Evaluation	3
ANSC 219	Meat Technology	3
ANSC 250	Companion Animals in Society	3
ANSC 301	Food Animal Production, Management, and Evaluation	3
ANSC 305	Human Animal Interactions	3
ANSC 306	Equine Science	3
ANSC 307	Companion Animal Management	3
ANSC 309	Meat Production and Marketing	2
ANSC 310	Meat Selection and Grading	3
ANSC 312	Advanced Livestock Evaluation	3
ANSC 313	Horse Appraisal	2
ANSC 314	Adv Dairy Cattle Evaluation	2
ANSC 322	Livestock Feeds and Feeding	3
ANSC 370	Companion Animal Policy	3
ANSC 400	Dairy Herd Management	3
ANSC 401	Beef Production	3
ANSC 402	Sheep Production	3
ANSC 403	Pork Production	3
ANSC 404	Poultry Science	3
ANSC 405	Advanced Dairy Management	2

Code	Title	Hours
ANSC 407	Animal Shelter Management	3
ANSC 424	Pet Food & Feed Manufacturing	3
ANSC 435	Milk Quality and Udder Health	2
ANSC 437	Adv Reproductive Management	2
ANSC 471	ANSC Leaders & Entrepreneurs	3
Select two of the following Basic Sciences courses:		6
ANSC 251	Epidemics and Infectious Diseases	3
ANSC 331	Biology of Reproduction	2-4
ANSC 350	Cellular Metabolism in Animals	3
ANSC 363	Behavior of Domestic Animals	3
ANSC 366	Animal Behavior	3
ANSC 406	Zoo Animal Conservation Sci	3
ANSC 409	Meat Science	3
ANSC 420	Ruminant Nutrition	3
ANSC 421	Minerals and Vitamins	3
ANSC 422	Companion Animal Nutrition	3
ANSC 431	Advanced Reproductive Biology	3
ANSC 438	Lactation Biology	4
ANSC 440	Applied Statistical Methods I	4
ANSC 441	Human Genetics	3-4
ANSC 444	Applied Animal Genetics	3
ANSC 445	Statistical Methods	4
ANSC 446	Population Genetics	3-4
ANSC 447	Advanced Genetics and Genomics	4
ANSC 448	Math Modeling in Life Sciences	3-4
ANSC 449	Biological Modeling	3-4
ANSC 450	Comparative Immunobiology	4
ANSC 451	Microbes and the Anim Indust	3
ANSC 452	Animal Growth and Development	3-4
ANSC 453	Stem Cell Biology	3-4
ANSC 467	Applied Animal Ecology	3
ANSC 509	Muscle Biology	2
ANSC 510	Science of Animal Well-Being	
ANSC 520	Protein and Energy Nutrition	3
ANSC 521	Regulation of Metabolism	3

Code	Title	Hours
ANSC 522	Advanced Ruminant Nutrition	3
ANSC 523	Techniques in Animal Nutrition	3
ANSC 524	Nonruminant Nutrition Concepts	2
ANSC 525	Topics in Nutrition Research	1
ANSC 526	Adv Companion Animal Nutrition	3
ANSC 533	Repro Physiology Lab Methods	1-3
ANSC 541	Regression Analysis	5
ANSC 542	Applied Bioinformatics	4
ANSC 543	Bioinformatics	4
ANSC 545	Statistical Genomics	3-4
ANSC 554	Immunobiological Methods	3
ANSC 561	Animal Stress Physiology	2
Additional elective courses must be completed to yield at least 126 total Hours for graduation.		20-29
Total Hours		**126**

The required 126 hours must include a minimum of 40 hours of 300- and 400-level courses

or

Animal Sciences: Science, Pre-Veterinary & Medical, BS

Degree Requirements for the degree of Bachelor of Science Major in Animal Sciences, Science, Pre-Veterinary & Medical concentration

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Prescribed Courses including Campus General Education

Code	Title	Hours
Composition I and Speech		
RHET 105	Writing and Research (or equivalent) (see college Composition I requirement)	4
CMN 101	Public Speaking	3
Advanced Composition		
Select from campus approved list.		3-4
Cultural Studies		
Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists.		9
Foreign Language		
Coursework at or above the third level is required for graduation.		
Quantitative Reasoning I		
Select one of the following:		4-5
MATH 220	Calculus	4
MATH 221	Calculus I	5

Code	Title	Hours
MATH 234	Calculus for Business I	4
Quantitative Reasoning II		
Select one of the following:		3-4
ACE 261	Applied Statistical Methods	4
CPSC 241	Intro to Applied Statistics	3
ECON 202	Economic Statistics I	3
PSYC 235	Intro to Statistics	3
STAT 100	Statistics	3
SOC 280	Intro to Social Statistics	4
Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	5
Humanities and the Arts		
Courses selected from campus approved list		6
Social Sciences		
ECON 102 or ACE 100	Microeconomic Principles Agr Cons and Resource Econ	3
Additional social or behavioral science course; cannot be an economics course.		3-4
ACES Required		
ACES 101	Contemporary Issues in ACES	2
Animal Sciences Required		
ANSC 100	Intro to Animal Sciences	4
ANSC 101	Contemporary Animal Issues	3
ANSC 103	Working With Farm Animals	2
ANSC 221	Cells, Metabolism and Genetics	3
ANSC 222	Anatomy and Physiology	3
ANSC 223	Animal Nutrition	3
ANSC 224	Animal Reproduction and Growth	4
ANSC 298	Undergraduate Seminar	1
ANSC 398	UG Experiential Learning [1]	1
ANSC 498	Integrating Animal Sciences	2

Course List

[1] ANSC 398 only fulfills the degree requirement when taken for a standard letter grade.

Code	Title	Hours
Science, Pre-Veterinary and Medical Concentration Required		
Select two of the following Applied Sciences courses:		6
ANSC 201	Principles of Dairy Production	3
ANSC 204	Intro Dairy Cattle Evaluation	2
ANSC 205	World Animal Resources	3
ANSC 206	Horse Management	3
ANSC 211	Breeding Animal Evaluation	3
ANSC 219	Meat Technology	3
ANSC 250	Companion Animals in Society	3
ANSC 301	Food Animal Production, Management, and Evaluation	3
ANSC 305	Human Animal Interactions	3
ANSC 307	Companion Animal Management	3
ANSC 309	Meat Production and Marketing	3
ANSC 310	Meat Selection and Grading	2
ANSC 312	Advanced Livestock Evaluation	3
ANSC 313	Horse Appraisal	3
ANSC 314	Adv Dairy Cattle Evaluation	2
ANSC 322	Livestock Feeds and Feeding	2
ANSC 370	Companion Animal Policy	3
ANSC 400	Dairy Herd Management	3
ANSC 401	Beef Production	3
ANSC 402	Sheep Production	3
ANSC 403	Pork Production	3
ANSC 404	Poultry Science	3
ANSC 405	Advanced Dairy Management	3
ANSC 407	Animal Shelter Management	2
ANSC 424	Pet Food & Feed Manufacturing	3
ANSC 435	Milk Quality and Udder Health	3
ANSC 437	Adv Reproductive Management	2
ANSC 471	ANSC Leaders & Entrepreneurs	2
Select four of the following Basic Sciences courses:		12
ANSC 251	Epidemics and Infectious Diseases	3
ANSC 306	Equine Science	2-4
ANSC 331	Biology of Reproduction	3

Code	Title	Hours
ANSC 350	Cellular Metabolism in Animals	3
ANSC 363	Behavior of Domestic Animals	3
ANSC 366	Animal Behavior	3
ANSC 406	Zoo Animal Conservation Sci	3
ANSC 409	Meat Science	3
ANSC 420	Ruminant Nutrition	3
ANSC 421	Minerals and Vitamins	3
ANSC 422	Companion Animal Nutrition	3
ANSC 431	Advanced Reproductive Biology	4
ANSC 438	Lactation Biology	4
ANSC 440	Applied Statistical Methods I	3-4
ANSC 441	Human Genetics	3
ANSC 444	Applied Animal Genetics	4
ANSC 445	Statistical Methods	3-4
ANSC 446	Population Genetics	4
ANSC 447	Advanced Genetics and Genomics	3-4
ANSC 448	Math Modeling in Life Sciences	3-4
ANSC 449	Biological Modeling	4
ANSC 450	Comparative Immunobiology	3
ANSC 451	Microbes and the Anim Indust	3-4
ANSC 452	Animal Growth and Development	3-4
ANSC 453	Stem Cell Biology	3
ANSC 467	Applied Animal Ecology	2
ANSC 509	Muscle Biology	
ANSC 510	Science of Animal Well-Being	3
ANSC 520	Protein and Energy Nutrition	3
ANSC 521	Regulation of Metabolism	3
ANSC 522	Advanced Ruminant Nutrition	3
ANSC 523	Techniques in Animal Nutrition	2
ANSC 524	Nonruminant Nutrition Concepts	1
ANSC 525	Topics in Nutrition Research	3
ANSC 526	Adv Companion Animal Nutrition	1-3
ANSC 533	Repro Physiology Lab Methods	5
ANSC 541	Regression Analysis	4
ANSC 542	Applied Bioinformatics	4

Code	Title	Hours
ANSC 543	Bioinformatics	3-4
ANSC 545	Statistical Genomics	3
ANSC 554	Immunobiological Methods	2
ANSC 561	Animal Stress Physiology	3
Additional elective courses must be completed to yield at least 126 total Hours for graduation.		20-29
Total Hours		**126**

The required 126 hours must include a minimum of 40 hours of 300- and 400-level courses

And

Animal Sciences, MANSC

Degree Requirements

Code	Title	Hours
ANSC 590	Animal Sciences Seminar	2
ANSC 440	Applied Statistical Methods I	4
or ANSC 445	Statistical Methods	
500-level courses		6
(excludes ANSC 590, ANSC 592, ANSC 593)		
400- or 500-level ANSC courses		6
(excludes ANSC 590, ANSC 592, ANSC 593, ANSC 440, ANSC 445)		
Other graduate-level electives		8
(excludes ANSC 590, ANSC 592, ANSC 593, ANSC 440, ANSC 445)		
ANSC 592	Adv Topics in Animal Science	6
or ANSC 593	Res Studies in Animal Sciences	
Total Hours		**32**

* A maximum of 12 graduate-level credit hours from the B.S. degree will count towards the MANSC degree