

**UNIVERSITY COUNCIL
ACADEMIC PROGRAMS COMMITTEE
REQUEST FOR DECISION**

PRESENTED BY: Len Proctor, Chair, Academic Programs Committee of Council

DATE OF MEETING: April 19, 2012

SUBJECT: **College of Agriculture and Bioresources: BSc in Animal Bioscience**

DECISION REQUESTED:

It is recommended:

That Council approve the proposal from the College of Agriculture and Bioresources to create a new Bachelor of Science in Animal Bioscience [B.Sc.(An.Biosc.)] degree program in the field of study of Domestic Animal Biology.

PURPOSE:

The proposed program is an academic program at the University of Saskatchewan. Implementation of new programs requires approval by University Council.

SUMMARY:

The objective of the proposed program is to respond to demand for graduates trained in the biomedical sciences of veterinary, companion, equine and research animal care, animal health and environmental sciences. The program will attract new students to the college who are interested in animal science and welfare of domesticated animals rather than the husbandry of food animals.

This will be a four-year program requiring core courses in biology, chemistry and biochemistry, as well as courses in domestic animal biology. The program will focus on experiential learning including direct involvement with a wide variety of domestic animals and relevant laboratory skills.

New courses

ANBI 110.3 Introductory Animal Bioscience
ANBI 320.3 Equine Science
ANBI 420.3 Comparative Animal Endocrinology
ANBI 492.3 Literature Thesis in Animal Bioscience
ANBI 494.6 Research Thesis in Animal Science

REVIEW:

At its April 5, 2012 meeting, the Academic Programs Committee discussed this proposal with Murray Drew and Andrew Van Kessel. The Committee agreed that this proposal was assembled and documented very well, with detailed consultation, clear program and learning objectives, and curriculum mapping to industry requirements and potential occupations. Because the college intends to implement the program in September, 2013, the college has the next year to recruit students for the program. The Committee agreed to recommend approval of this proposal to Council.

ATTACHMENTS:

Proposal documentation and related memos



1.0 Proposal for a Curriculum Change:

1.1 Proposal Identification:

Title of Proposal: Bachelor of Science in Animal Bioscience [B.Sc. (An. Biosc.)], College of Agriculture and Bioresources, University of Saskatchewan

Degree(s): Bachelor of Science in Animal Bioscience

Field(s) of Specialization: Domestic Animal Biology

Level(s) of Concentration: Major

Option(s): None

Degree College: Agriculture and Bioresources

Department: Animal and Poultry Science

Home College: Agriculture and Bioresources

Contact persons (name, telephone, fax, e-mail):

Andrew G. Van Kessel,
Professor and Head,
Animal and Poultry Science,
University of Saskatchewan,
51 Campus Drive, Saskatoon S7N 5A8
Phone 966-4136
Email: andrew.vankessel@usask.ca

Murray D. Drew,
Associate Dean Academic
University of Saskatchewan,
51 Campus Drive, Saskatoon S7N 5A8
Phone 966-2367
Email: murray.drew@usask.ca

Approved by the degree college and/or home college: March 8, 2012

Proposed date of implementation: September 2013

1.2 Type of Change

Requiring approval by Council

- ☒ **A new Degree-Level program or template for program.**
- ☐ A new Field of Specialization at the Major or Honours Level of
- ☐ Concentration or template for a major or honours program
- ☐ Conversion of an existing program from regular to special tuition program.
- ☐ A change in the requirements for admission to a program
- ☐ A change in quota for a college
- ☐ Program revisions that will use new resources
- ☐ A replacement program, including program deletion
- ☐ A program deletion (consult Program Termination Procedures, approved by Council in May 2001)

2. Executive Summary

The Department of Animal and Poultry Science currently offers one program: a Bachelor of Science in Agriculture (BSA) in Animal Science, which provides a strong focus on food animal agriculture. While this program continues to produce highly employable and satisfied graduates, there has been a gradual decline in student enrolment over the last decade. Furthermore, the nature of animal science has changed significantly in the last 10 years with an increasing demand for students trained to fill jobs in biomedical sciences, veterinary, companion, equine and research animal care, animal health and environmental sciences. There has also been a demographic shift characterized by decreased numbers of students with rural backgrounds and increased numbers of students from urban areas. Taken together, these trends indicate the need for a new degree program designed with greater appeal to urban students and to supply graduates with training to support careers in a broader range of fields related to domestic animal biology.

Other Universities across Canada have developed such programs. For example, the University of Alberta has developed several specialized animal science programs including animal health and explicit pre-veterinary programs that are aggressively marketed to non-traditional students interested in animal bioscience. Our proposal for a comparable program will maintain our ability to attract students from across Western Canada and support Saskatchewan's increasing urban demographic. We expect at least 20 students per year to enroll in this program.

The proposed program will not require any incremental physical and capital resources. The College of Agriculture and Bioresources has sufficient classroom, laboratory and office space to accommodate the program. The program will utilize a number of existing introductory courses offered in other Departments across campus and utilize a number of existing elective courses within the sponsoring Department (Animal and Poultry Science). Two new courses (a first year course in domestic animal biology and a fourth year course in endocrinology) will be created. This program will have less emphasis on food animal management courses compared to the BSA (animal science) and require courses in companion animal management, behavior, metabolism, physiology, diseases and environmental science. The program aligns with the expertise of two new faculty positions in the sponsoring Department and is identified in the 3rd Integrated Plan for the College of Agriculture and Bioresources as the primary means to attain new undergraduate enrolment targets. The development of this program is therefore aligned with our existing disciplinary expertise and will attract students from an increasing Saskatchewan demographic. It will also meet the requirements for entry into Veterinary Medicine and Medicine, further enhancing the opportunities of students. This program will provide a unique academic experience in domestic animal biology at the University of Saskatchewan with targeted career opportunities associated with the role of domestic animals in society.

3. RATIONALE FOR THE PROGRAM

3.1 Program Background and Objectives

Although the BSA (Animal Science) continues to be a very strong program in the College of Agriculture and Bioresources, enrolment numbers in courses taught by our faculty and in the program have shown a gradual decline over the past 10 years. The decline in enrolment does not reflect any loss of program quality or reputation, but rather demographic trends in Saskatchewan and western Canada associated with declining rural populations and larger intensive farming operations which combine to significantly reduce the rural high school graduating cohort familiar or interested in agricultural practices. The predicted dramatic decline in the entire high school graduating cohort in Saskatchewan over the next 5 - 10 years will exacerbate this trend. Furthermore, the opening of a new veterinary school in Calgary, and aggressive marketing of pre-veterinary and animal health programs at the University of Alberta are likely to lower the number of students entering the U of S major from that province and possibly British Columbia.

Animal and Poultry Science faculty have moved to make the BSA (Animal Science) more attractive to urban students interested in animal biology or veterinary science by adding course options in companion animals (ANSC360, ANSC250, ANSC350) and environmental science (ANSC375). While these courses have been successful in attracting course enrolment by students from outside the Animal Science major they do not seem to have appreciably increased overall enrolment in the Animal Science major, particularly from urban students. Informal surveys of urban students in the Animal Science major, and of non-Animal Science majors attending companion animal courses, suggests the strong focus on production agriculture limits enrolment by this demographic.

The Department of Animal and Poultry Science has a national and international reputation in production animal agriculture with a major focus in food animal management and nutrition. We see food animal agriculture as a continued primary focus of the Department and with the support of AgBio, the University of Saskatchewan, government and industry sponsors, have made or are making major investments in infrastructure development to support this activity. Accordingly, we anticipate that the BSA (Animal Science) will continue to be the dominant undergraduate program offered by the department. Nevertheless, recent enrolment statistics, the reality of demographic trends and pressures from outside the province indicate that a strategy to improve enrolment from the urban demographic is prudent and presents an exciting opportunity.

We do not want to dilute the production animal focus of the BSA (Animal Science), which indeed is responsible for the major strength of this program within the College of Agriculture and Bioresources. Nevertheless the strong animal production reputation and focus of the BSA (Animal Science) limits its marketability to urban students. Further, for those students who do enter the BSA without an agricultural background but are interest in animals, first year AGRC (111, 112, 113) courses with production agriculture focus may dissuade continuation in the BSA animal science major. Statistics supplied by the Associate Dean Academic for AgBio suggest 10-20% of students enrolled in these first year classes do not continue in a BSA program.

We believe there is an urban cohort of students with interest in animals that are not attracted by the BSA (Animal Science) and its concomitant early emphasis on production agriculture. Further, there is career opportunity for students with a strong foundation in applied animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of conventional agriculture including biomedical sciences, companion, equine and research animal care, animal health and environmental sciences. A B.Sc. (Animal Bioscience) with reduced focus on food animal management, crop production and agribusiness could draw heavily on Animal and Poultry Science faculty expertise (including new appointees) and could attract these students. Further, the urban students who may not be initially interested in food animal agriculture may reconsider on exposure to the industry and maturing over a 4 year program (as opposed to year 1 AGRC courses). Such "non-traditional"

students may be very important to sustaining a supply of educated individuals necessary to support food animal agriculture in future.

3.2 Rationale for the Proposed Degree Name

The proposed name for the new degree is a Bachelor of Science in Animal Bioscience. This will be abbreviated as B.Sc. (An. Biosc.). The nomenclature is similar to that used in other degrees such as, the Bachelor of Science in Agriculture (B.S.A.) and the Bachelor of Science in Agribusiness [B.Sc.(Agbus)].

This name indicates the nature of the degree to potential students. It is a B.Sc., and this differentiates it from the current B.S.A. and will make it more attractive to urban and other non-traditional students. Further, Animal Bioscience indicates an emphasis more on applied animal biology rather than on animal production. This clearly specifies this new degree as a gateway to jobs requiring a more basic background in animal biology, to professional programs including veterinary medicine and medicine, or graduate studies.

3.3 Need for the Program

The single program offered by the Department of Animal and Poultry Science has experienced declining enrolment over the last decade associated with a declining rural demographic. Further, our faculty complement has increased with addition of expertise in environmental sciences. The University of Saskatchewan does not currently offer a program well suited to students interested in domestic animal biology designed to address career opportunities identified above associated with domestic animal use and regulation. The proposed new degree is designed to more efficiently utilize resources in the Department and provide a unique program to meet expanding career opportunities.

The University of Alberta is our main competitor for undergraduate students. Our strengths are our program in animal nutrition and production agriculture. In support of this claim, the Alberta section of the Animal Nutrition Association of Canada (ANAC), offers their undergraduate student award to students at the U of S in recognition of the quality of our students in practical nutrition and animal feeding. However, we do not compete in the area of applied animal biology. The University of Alberta offers 4 programs in animal health/animal biosciences. Furthermore, their program in Pre-veterinary medicine is a handicap for our Department since many students are not explicitly aware that it is possible to obtain all required pre-veterinary courses in Animal and Poultry Science and/or their pre-veterinary interests are not aligned with food animal agriculture. At the University of Alberta, students can easily find a Pre-Vet program and obtain a 4-year degree in this program. Without a program in Animal Bioscience, we will lose students to the U of A.

3.4 Demand for the Program

The demand for a program in animal biosciences is apparent in the development of such programs in Animal Science departments across Canada. The creation of a more basic animal bioscience program that runs in parallel with the existing animal production program has already been implemented at McGill, Guelph, Alberta and British Columbia (Table 1). Nova Scotia Agriculture College, Laval and Manitoba, only offer traditional Animal Science programs at the present time. A synopsis of current programs follows

Nova Scotia

Nova Scotia Agriculture College currently offers a B.Sc. (Agr) in Animal Science similar to ours. They also offer a 2 year Pre-veterinary program that meets the requirements of entrance into the UPEI veterinary college.

Laval

Laval offers a B.Sc. certificate in livestock-dairy and beef. This program is similar to our current program.

McGill

McGill offers a traditional Animal Science program and majors in Animal Health and Disease and Animal Biology. The Animal Health major requires 15 credits in health and disease, physiology, endocrinology, pathology and immunology. It also requires one species-specific course. The Animal Biology major requires 15 credits in health and disease, physiology, embryology/reproduction, biotechnology and immunology. No species-specific courses are required.

Guelph

Guelph offers a traditional Animal Science program as well as a B.Sc. in Animal Biology. Both programs are offered in the Department of Animal and Poultry Science. Animal Biology requires courses in cell biology, immunology, and molecular biology and one species-specific course.

Manitoba

Manitoba offers a BSA in Animal Science. This program is similar to the one we currently offer.

British Columbia

British Columbia has dropped its BSA in Animal Science and now only offers a B.Sc. in Applied Animal Biology within the department of Land and Food Systems.

Alberta

Alberta offers a B.Sc. in agriculture in Animal Science. This program is similar to our current program. They also offer 4 programs in Animal Health: Companion and Performance Animals, Food Safety and Quality, Food Animals, and Pre-veterinary Medicine.

Table 1. A list of currently available programs similar to our current BSA and the proposed B.Sc. programs.

Programs similar to current BSA		
Nova Scotia	B.Sc. (Agr)	Animal Science
Laval	B.Sc.	Certificate in Livestock
McGill	BSc(AgEnvSc)	Animal Production
Guelph	B.Sc. (Agr)	Animal Science
Manitoba	BSA	Animal Systems
Saskatchewan	BSA	Animal Science
Alberta	B.Sc.	Animal Science
Programs similar to the proposed B.Sc.		
McGill	BSc(AgEnvSc)	Animal biology
	BSc(AgEnvSc)	Animal health and disease
Guelph	B.Sc.	Animal Biology
Alberta	B.Sc.	Animal Health Companion Animals
		Animal Health Food Animals
		Animal Health Food Safety and Quality
		Animal Health Pre-Veterinary Medicine
British Columbia	B.Sc.	Applied Animal Biology

3.5 Uniqueness and Expertise of the Sponsoring Unit

The proposed program will be unique on campus and draw heavily upon the expertise of recently hired faculty as well as existing capabilities in molecular biology, genetics, behaviour, physiology, metabolism and immunology. Our most recently hired faculty include Dr. Ryan Brook whose areas of expertise include aboriginal wildlife, land and resource management, wildlife-agriculture interactions, disease transmission risk modeling, and conflict, and climate change impacts on landscape change. Dr. Natacha Hogan has expertise in toxicology and endocrinology and has a co-appointment in the Northern Ecosystems Toxicology Initiative. Established faculty members have international reputations in nutrition, molecular genetics of cattle and dogs, nutrigenetics, molecular microbiology and intestinal physiology. The closest programs on campus to this proposal are in the Departments of Biology which do not focus on domestic animals but which provide considerable expertise through foundational course offerings. Programs offered by Veterinary Biomedical Science, Veterinary Pathology and Veterinary Microbiology focus on the veterinary medicine program but also provide faculty expertise for several courses in the BSA (Animal Science) and the proposed B.Sc. (An. Biosc.). The complement of competencies present in our Department and required for the B.Sc. (An. Biosc.) program is therefore unique on campus.

The infrastructure available in our Department is also unique on campus. In addition to our laboratories, we have available animal facilities for dairy and beef cattle, sheep, swine, finfish, poultry and dogs (via WCVM Animal Care Unit). Furthermore, our faculty and staff have expertise in the use of these species in research and teaching. There is additional opportunity to establish interactions with the Saskatoon Forestry Farm Park and Zoo and local equestrian facilities. Faculty also have existing field research programs in Saskatchewan on wild elk, deer, and feral wild boar providing further opportunities for teaching and research. These resources will allow a wide variety of experiences with animals for our students and present a broad range of undergraduate thesis research opportunities.

3.6 How this proposal relates to the Department/College Plans, Systematic Program Review (SPR), Other Recommendations

What is the relationship between the proposal and the Framework for Planning approved by Council (1998)?

Improving the quality of instructional programs.

The proposed program will improve the quality of our department's offerings by providing students with enhanced preparation for jobs in biomedical sciences, companion, equine and research animal care, animal health and environmental sciences. It will also widen the opportunities for students in graduate studies, and subsequent entry into professional programs such as Veterinary Medicine and Medicine.

Fostering the teacher-scholar model

Recent faculty hires have brought new areas of expertise into our department. We have expertise in animal-environmental interactions, toxicology, endocrinology and nutritional effects on health. This program brings our course offerings and faculty research programs into alignment. This will promote the teacher-scholar model by increasing the impact of our faculty's research on their teaching.

Respond to the needs of aboriginal people

One of the aims of this program is to recruit non-traditional students including, aboriginal students. The large land base controlled by Saskatchewan's aboriginal people will require highly trained managers with expertise in animal health management, animal-environmental interactions and biosciences. This program will be a better fit with many non-farm aboriginal students and therefore, better serve this population. One Earth Farms is a partnership between First Nations, and the private sector and it has become the largest corporate cattle and grain farming operation in Canada. Based in Saskatchewan, this company has a stated goal of farming one million acres in the next five years. This anticipated growth provides important new connections between aboriginal communities and agriculture, as well as considerable growth in need for training in the agricultural and related sectors. Furthermore, Dr. Ryan Brook is Theme Leader (Aboriginal Peoples and the Environment) in the Indigenous Land Management Institute and his research program and outreach and engagement focus includes aboriginal youth

education and training. Dr. Brook's participation in aboriginal communities on the Canadian prairies will help to highlight the program among prospective aboriginal students and adds specific aspects that will be highly attractive to aboriginal students.

Is the proposed program appropriate to a university?

This program will provide students with a background in basic sciences, mathematics and humanities as well as the courses in animal biosciences. Thus, the program is of high intellectual quality and provides a breadth of knowledge suitable to the standards of excellence set by the University of Saskatchewan. Furthermore, programs similar to this proposal have been implemented at 4 Canadian universities.

What is the relationship of the proposed program to other programs offered by the sponsoring unit?

The proposed program fits well with our current BSA in Animal Science. The BSA program has production agriculture as its central focus. Students are required to take courses on the production of swine, beef cattle, dairy cattle, range management and poultry. Graduates of this program are primarily employed in feeds/nutrition and animal production. They are widely seen as the best-prepared students in Western Canada as evidenced for example, by the awarding of student scholarships to our students rather than University of Alberta students by the Alberta chapter of the Animal Nutrition Association of Canada. The proposed program will provide students with an applied biological background. They will be the graduates of choice for careers in animal health, pharmaceutical and environmental sciences.

How does this proposal fit with the current College academic plan?

B.Sc. in Animal Bioscience is part of the 3rd Integrated Plan for the College and Agriculture and Bioresources (IP3). The goals stated are to "provide a strong foundation in applied animal biology to supply graduates well prepared to work in biomedical sciences, companion animal research, animal care, animal health and environmental studies related to domestic animals." The development of this program also supports other goals of IP3 such as, recruitment of urban students and increased engagement of students in research. It is also an essential part of the College's plan to reach a target enrollment of 800.

3.7 Response to Cross-College and Planning Committee of Council Consultations

Planning and Priorities Committee of Council

The Notice of Intent to offer a B.Sc. in Animal Bioscience was considered at a meeting of the Planning and Priorities Committee of Council on November 16, 2011. The meeting was attended by Dan Pennock (Assoc Dean Academic AgBio) and Andrew Van Kessel (Head, Animal and Poultry Science). Planning and Priorities Chair, Dr. Bob Tyler provided the Committee's response and recommendations for development of the full proposal in a letter dated November 21, 2011 (Appendix 1). Two recommendations were specifically identified by the committee. First, it was recommended the program allow students to meet prerequisites for Medicine as well as Veterinary Medicine. We have confirmed that students enrolled in the B.Sc. (An. Biosc.), with appropriate selection of electives could meet requirements for application to both programs within the first 60 credits. The second recommendation was to consider permitting students to transfer from the B.Sc (An. Biosc.) to B. Comm. as is currently possible for BSA students. This transfer is largely facilitated for BSA students majoring in Agricultural Economics or students enrolled in the B.Sc. (Agribusiness). However, disciplinary requirements necessary in biological sciences in the B.Sc. (An. Biosc.) would preclude transfer to the B.Comm. without additional time in program. The B.Sc. (An. Biosc.) program does facilitate enrolment as open electives in courses offered by the Department of Bioresource Policy, Business and Economics and the Edwards School of Business where prerequisite requirements for these courses permit.

Cross Department and College Consultations

Letters providing a brief overview of the B.Sc. (An. Biosc.) and expected enrolment were sent to heads of all Departments offering courses required in the proposed program. The letters listed specific courses affected and invited responses indicating any resource issues associated with increased enrolment demand from the new program. In some cases meetings with affected Departments to discuss the

program and potential modifications were facilitated. Letters and associated correspondence are provided in Appendix 2.

Food and Bioproduct Sciences, College of Agriculture and Bioresources

No immediate resource issues identified associated with FABS 212.3

Plant Sciences, College of Agriculture and Bioresources

Classroom size could limit enrolment in PLSC 314 Statistical Methods. This will be monitored.

Ron and Jane Graham Centre for Study of Communication, College of Engineering

Teaching resources are available to offer RCM 300 in Term 1 but Term 2 teaching resources are currently fully utilized. Faculty programmers will therefore encourage students in the Animal Bioscience program to enroll in this course in Term 1. RCM 404 Leadership as Communication, was included as a restricted elective on review of RCM course offerings.

Department of Chemistry, College of Arts and Science

After consultation with Dr. Ian Burgess, Chair of the undergraduate curriculum committee CHEM 115.3 was added as a required course. In addition the normal scheduling of the 3 Chemistry courses was modified to better distribute enrolment among Chemistry courses and avoid resource limitations.

Department of Biochemistry, College of Medicine

No resource issues were identified as affected course offerings (BMSC 200 and 230) are lecture based and offered in multiple sections. Recommend students in B.Sc. (An. Biosc.) enroll in section 2 of BMSC 230 offered in term 2 as this section most able to accommodate additional students. Class room size could become limiting for enrolment in these courses.

Department of Microbiology and Immunology, College of Medicine

The B.Sc. (An. Biosc.) accepts either FABS 212.3 or BMSC 210 as meeting the program requirement in introductory microbiology. Dr. Bretcher noted the two courses are not equivalent emphasizing different disciplinary components, nevertheless both courses can serve as prerequisites for higher level MCIM courses. BMSC 210 is fully subscribed due to classroom size limitations (lecture based only) but B.Sc. (An. Biosc.) students would have access on the current first-come-first-serve basis. No resource limitations were identified for FABS 212.3 permitting students to meet this degree requirement should BMSC210.3 be oversubscribed. MCIM 321.3 Principles of Immunology was noted as a suitable restricted elective for B.Sc. (An. Biosc.).

Department of Math and Statistics, College of Arts and Science

Dr. Srinivasan identified no resource issues associated with offering MATH104.3. This course is the primary course taken by current students in College of Agriculture and Bioresources programs and similar is expected with respect to the B.Sc. (An. Biosc.) program. The B.Sc. (An. Biosc.) will also accept MATH110 or MATH125 as fulfilling the math requirement. Although not expected, should enrolment in these courses be substantively increased by B.Sc. (An. Biosc.) students, support for a tutorial assistant may be required.

Department of Biology, College of Arts and Science.

Constructive consultations were held with the Department of Biology including communication of a draft proposal and face-to-face meetings with Drs. Jack Gray (Acting Head) and Chris Todd (Chair, Biology Undergraduate Affairs Committee) on October 31, 2011 and January 10, 2012. Dr. Todd shared these discussions and draft proposal with the Biology UAC before preparing a formal Departmental response. The response letter indicated support for the new degree while listing several concerns and opportunities which arose from the consultative process.

An opportunity to facilitate easier cross-over of students between Departments for access to senior course offerings was noted. Consultation achieved some progress in this respect. For example, BIOL 317.3 and VBMS 324 were identified as comparable and therefore either course

was listed as meeting the prerequisite for ANBI 420. BIOL 430 lists BIOL 317 or permission of instructor; which would be granted by the instructor in the case of students with VBMS 324. BIOL 430 was therefore added to the restricted electives list for the new degree. Unfortunately, The College of Arts and Science "pink list" also restricts student access to ANBI 420 and other Animal Science and proposed Animal Bioscience courses for credit towards their degree even as open electives. Under current A&S processes these courses can only be taken for Biology degree credit if listed as restricted electives in the Biology major. The departments have indicated a desire to continue consultations to remove such barriers in future.

A space limitation was identified for BIOL 120.3 and BIOL 224.3 such that new student enrolment associated with the Animal Bioscience degree cannot be guaranteed. Discussion to improve access to these courses is ongoing within the College of Arts and Science. Animal and Poultry Science is hopeful these discussions will resolve access issues through current tuition revenue sharing processes and/or implementation of TABBS prior to significant enrollment increases associated with the new degree.

It was noted that BSA (Animal Science) students which normally take BIOL224.3 Animal Body Systems in term 2 of year 1 tend to underperform from the class average; a trend also observed for Kinesiology students who also in general take the course in first year. Thus the grade discrepancy is likely a consequence of student maturity, where the majority of the class cohort is second year students. While we recognize the situation is not ideal, rescheduling of BIOL224 in 2nd year of the B.Sc. (An. Biosc.) program has two major disadvantages. First, the prerequisite for ANSC313 Animal Breeding and Genetics is 6 credits of Biology courses. This has specifically been done to accommodate students who wish to fulfill pre-veterinary course requirements within the first two years of study. As a genetics course meeting the requirement for WCVM entry, ANSC 313 is thus scheduled in term 2 of second year in the Animal Bioscience program. Normally BIOL 120 and 224 would meet the prerequisite requirement. BIOL 224 also provides useful foundational knowledge for ANSC 212 normally taken in Term 1 of year 2. We have not, however, listed BIOL 224 as a prerequisite because the restriction would limit enrolment of students (approx 10-15) from outside of the BSA (Animal Science) or proposed B.Sc. (An. Biosc.).

BIOL 316.3 was removed as a restricted elective in the Animal Bioscience degree due to the identification of BIOL226 as a prerequisite as noted by the Biology UAC. Although BIOL 226 could be taken as an open elective removal from the restricted elective list was considered the best option.

The Biology UAC acknowledged that ANSC313 meets the genetics course requirement for WCVM entrance, but suggested confirmation for the University of Calgary, College of Veterinary Medicine (UCVM). UCVM only lists the number of courses within several categories as meeting entrance requirements. One Introductory course in Genetics is listed, however, only qualifying courses offered by UofC as examples are specifically identified. Animal and Poultry Science are in contact with UCVM to begin the process confirming specific UofS courses as meeting their requirements. Previous students in the BSA (Animal Science) program have successfully entered UCVM indicating the BSA can meet requirements.

Biology UAC expressed concern over the use of the term Animal Biology to describe the field of specialization for the new degree. The term was modified to Domestic Animal Biology. We employed the term "Bioscience" in the degree name to avoid any direct confusion with Biology programming. However, domestic animal scientists are considered biologists and as such biology is the appropriate term to use as the field of specialization. We consider the Animal Science program well positioned for students interested in domestic animals but not necessarily animal agriculture. While the program is designed to permit students to complete application requirements for veterinary medicine within the first two years of study, the program also lists a number of career opportunities for Animal Bioscience students who complete the program. The

current draft includes disciplinary maps linking career opportunities identified with disciplinary knowledge and skills provided by the course offerings.

Biology UAC review of the draft list of restricted electives identified several senior biology course offerings that were either no longer regularly offered (BIOL 312) or the required Biology prerequisites were not included as part of the Animal Bioscience degree core offering (BIOL 436 and TOX 301). These were deleted from the restricted electives list. Reconsideration could occur as part of Departmental discussion to reduce barriers to senior course offerings as noted above.

Department of Veterinary Biomedical Sciences, Western College of Veterinary Medicine

There is a long history of food animal research, teaching, infrastructure and research collaboration between Animal and Poultry Science and WCVM. Faculty in Animal and Poultry Science and WCVM commonly instruct courses in the Doctor of Veterinary Medicine and Animal Science programs. This relationship has been continued on a largely informal basis since the first classes entered the WCVM. Dr. Barry Blakley, indicated the “enthusiastic support” of WCVM faculty to continue to provide lecture and laboratory instruction for VBMS324.3, VBMS325.3 and VBMS314.3 courses offered in the BSA (Animal Science) and B.Sc. (Animal Bioscience) programs. Dr. Blakely noted however, that these 3 courses in particular include significant laboratory components and thus resources (laboratory equipment, supplies, teaching assistants) which to accommodate additional students. It was noted that, due to the separate funding agreement for WCVM by the 4 western provinces, tuition revenue for AgBio courses taught by WCVM (and vice versa) do not flow to either college. A review is underway to address this issue and accommodate resource allocation for these courses.

4. DESCRIPTION OF PROGRAM CHARACTERISTICS

4.1 Program Description

The B.Sc. in Animal Bioscience will be a 4 year degree in the College and Agriculture and Bioresources. It will require 120 cu including core science requirements in biology, chemistry and biochemistry, mathematics, humanities and English. The program will provide students with a broad background in domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) and prepare them to work in fields outside of traditional animal agriculture including biomedical sciences, companion, equine and research animal care, animal health and environmental sciences. The program focuses on experiential learning including:

- 1) Direct involvement with a wide variety of domestic animals
- 2) Relevant laboratory skills
- 3) Ability to work independently and in groups
- 4) Review, synthesis and communication of information
- 5) Development of decision making and problem solving skills

The program matches the current BSA in Animal Science sufficiently that students will be able to switch between programs with ease within their first 2 years in the program. Explicit Minor programs will not be developed for the program. However, the choice of restricted and open electives will allow students to select a subject concentration suitable to their goals after graduation. With the addition of appropriate electives, the program will also meet the requirements for entry into Veterinary Medicine and Medicine within the first 60 cu. Thus, the program provides a high degree of flexibility for students.

Disciplinary Maps

A disciplinary mapping exercise was undertaken to establish skills and knowledge areas required for career paths in targeted areas and to ensure that students enrolled in the program would attain these. Tables showing skills and knowledge areas attained in specific courses offered in the B.Sc. (An. Biosc.) are shown in Appendix 3. Corresponding skills and knowledge areas required for targeted career paths are shown in Appendix 4.

New Course Prefix

The prefix we have selected for use with courses closely identified with the B.Sc. (An. Biosc.) program offered in Animal and Poultry Science is ANBI. New courses specifically designed for the program and courses offered as restricted electives in the BSA (Animal Science) program that have been identified as required in the B.Sc. (An. Biosc.) program will be renamed with this prefix. A list of new and renamed courses is given in Table 2. The use of a unique prefix for these courses will help to establish a clear identity for the program that is separate from the BSA (Animal Science).

Table 2. New and previously offered courses in Animal and Poultry Science to be assigned the ANBI course prefix

Proposed new course prefix and number	Current course prefix and number	Course Title	First Offering or Course Change	Comment
ANBI 110.3	N/A	Introductory Animal Bioscience	Sept 2013	New course
ANBI 320.3	N/A	Equine Science	Sept 2013	New course replaces ANSC250 and ANSC350
ANBI 360.3	ANSC 360	Canine and Feline Science	Sept 2013	
ANBI 375.3	ANSC 375	Animals and the Environment	Sept 2013	
ANBI 411.3	ANSC 411	Behaviour of Domestic Animals	Sept 2013	Offered annual vs. every other year
ANBI 420.3	N/A	Comparative Animal Endocrinology	Sept 2013	New course
ANBI 470.3	ANSC 470	Applied Animal Biotechnology	Sept 2013	
ANBI 492.3	N/A	Thesis	Sept 2013	New course to run parallel with ANSC 492
ANBI 494.6	N/A	Thesis	Sept 2013	New course to run parallel with ANSC494

4.2 Program Syllabus^a

First Year	30 cu
ANBI 110.3	Domestic animal biology ^b
BIOL 120.3	Nature of life
CHEM 112.3	General chemistry I
CHEM 115.3	General chemistry II
MATH 104.3, 110.3 or 125.3	Mathematics
AGRC 112.3	Animal production and food science
BIOL 224.3	Animal body systems
3 cu	English
6 cu	Humanities, social science or fine arts
Second Year	30 cu
ANSC 212.3	Livestock and poultry production
ANSC 313.3	Animal breeding and genetics
BMSC 200.3	Biomolecules
BMSC 230.3	Metabolism
CHEM 250.3	Organic chemistry
FABS 212.3 or BMSC 210.3	Microbiology
PLSC 314.3	Statistical Methods
RCM 300.3	Rhetorical communication
3 cu	Open
3 cu	Restricted electives
Third year	30 cu
ANBI 375.3	Animals and the environment ^c
ANSC 315.3	Animal and poultry nutrition
VBMS 324.3	Animal physiology I
VBMS 325.3	Animal physiology II
VBMS 314.3	Comparative Anatomy
6 cu	Open
9 cu	Restricted electives
Fourth Year	30 cu
ANBI 492.3 or 494.6	Thesis ^b
ANBI 470.3	Applied animal biotechnology ^c
ANBI 411.3	Behaviour of domestic animals ^c
ANBI 420.3	Endocrinology ^b
VLAC 411 or VTPA 412	Animal or poultry diseases
9 cu	Open
6 cu	Restricted Electives

^aSee Appendix 5 for program requirements by term.^bNew course^cRecommended name or number change

4.3 Draft Calendar Entry

Bachelor of Science in Animal Bioscience [B.Sc. (An. Biosc.)]

The Bachelor of Science in Animal Bioscience provides students with a broad background in domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) and prepares them to work in fields outside of traditional animal agriculture including biomedical sciences, companion, equine and research animal care, animal health and environmental sciences. The program focuses on experiential learning including:

- 1) Direct involvement with a wide variety of domestic animals
- 2) Relevant laboratory skills
- 3) Ability to work in unstructured environments
- 4) Review, synthesis and communication of information
- 5) Development of decision making and problem solving skills

First Year Requirements*

ANBI 110.3; BIOL 120.3; CHEM 112.3; MATH 104.3 or MATH 110.3 or MATH 125.3; AGRC 112.3; BIOL 224.3; CHEM 115.3; 3cu ENG; 6 cu Humanities, social science or fine arts

Second Year Requirements

ANSC 212.3; FABS 212.3; BMSC 200.3; BMSC 230.3; CHEM250.3; PLSC 314.3; RCM 300.3; ANSC 313.3; 3 cu Open; 3 cu Restricted Electives

Third Year Requirements

ANSC 315.3; VBMS 324.3; VBMS 314.3 ANBI 375.3; 6 cu Open; 9 cu Restricted Electives

Fourth Year Requirements

ANBI 492.3 or 494.6; ANBI 470.3; ANBI 411.3; ANBI 420.3; VLAC 411.3 or VTPA 412.3; 9 cu Open; 6 cu Restricted Electives

RESTRICTED ELECTIVES: Students must take 18 cu of the following restricted electives [Course titles are included as Appendix 6]

ANIMAL SPECIES SPECIFIC RESTRICTED ELECTIVES (a minimum of 6 cu of the following courses)

ANBI 320.3; ANBI 360.3; ANSC 340.3; ANSC 410.3; ANSC 430.3; ANSC 440.3; ANSC 460.3.

DISCIPLINE SPECIFIC RESTRICTED ELECTIVES

ANSC 301.3; BIOC 310.3; BIOC 311.3; BIOC 435.3; BIOC 436.3; BIOL 430.3; BINF 210.3; BMSC 220.3; BMSC 240.3; FABS 325.3; FABS 430.3; FABS 450.3; MCIM 209.3; MCIM 308.3; MCIM 321.3; PCOL 350.6; PHYS 115.3; PLSC 422.3; RCM 404.3; RRM 312.3; TOX 300.3; TOX 402.3; one of VLAC 411.3 or VTPA 412.3

4.4 Saskatchewan High School Subjects Required for Admission

Biology 30

Chemistry 30

Foundations of Mathematics 30 or Pre-calculus 30

Students can be admitted into this college with one subject deficiency that must be cleared before the second year of study.

5. RESOURCES

5.1 College of Agriculture and Bioresources Statement

See Appendix 7

5.2 Department of Animal and Poultry Science Statement

See Appendix 8

6. BUDGET

6.1 Budget Requirements for New Programs and Major Revisions

1. Proposal Identification

Full name of program: Bachelor of Science in Animal Bioscience

Short form (degree abbreviation): B.Sc. (An. Biosc.)

1. Full costing of resource requirements

a) Capital and Start-up Costs:

Start up costs include the development of two new courses ANBI 110 and ANBI 420. Existing faculty are involved in the development of the courses as part their assigned duties.

There are no additional capital costs. A teaching laboratory facility (Ag 2D88) is available and equipped with necessary items for the new program.

In 2012/13 some promotional expenses will be incurred to attract prospective students for the fall 2013 launch.

b) Permanent Operating Costs:

	2013/14	2014/15	2015/16	2016/17
Delivery costs	4,200	9,334	13,355	13,739
Indirect College costs	3,500	4,260	5,318	6,207
University overhead	1,155	2,039	2,801	2,992
Total On-going Costs	8,855	15,633	21,474	22,938

Delivery Costs

1. Faculty. The B.Sc. (An. Biosc.) utilizes existing resources and available capacity in current course offerings. The program also maximizes use of restricted electives developed for the BSA (animal science) program such that there are limited incremental costs. A sessional lecturer will be appointed to deliver ANBI 320 every year. The course would normally be offered every other year for the BSA therefore the cost of the sessional lecturer is shared with the BSA program.

A review of course capacity and projected B.Sc. (An. Biosc.) enrolment results in a better utilization of existing resources. Capacity for each required course was determined based on current seats and enrolments for existing courses based on Sirius data for 2011/12.

The B.Sc. (An. Biosc.) includes many courses outside of the College of Agriculture and Bioresources and, as indicated in section 3.7, the affected Departments and colleges have indicated their support. Through tuition revenue sharing or TABBS, some departments will benefit from increased enrolment to compensate for additional costs. In the case of WCVM, there may be a need to provide some resources to assist with larger class sizes.

2. Laboratories and teaching assistants. A laboratory is associated with the new course ANBI 110. Student teaching assistants would provide an adequate level of instruction for this purpose. A provision for laboratory supplies is also included. Additional teaching assistants support is increased to assist with increased enrolments in AgBio courses.

Indirect College Costs

Indirect cost estimates include college administration, along with recruitment and promotion, These costs are budgeted to be conservative and may not be incremental costs but a reallocation of activity already occurring. At this time, the impact of TABBS and indirect cost distribution has not been considered.

University Services

For budget purposes, University overhead is included at a rate of 15% to demonstrate the program would contribute to central costs and functions.

2. Sources of funding

Incremental delivery costs will be funded through the tuition revenue generated.

Indirect College costs will be funded through the College allocation of the operating grant or new tuition revenue. It is anticipated that many of these activities already occur and the incremental impact will not be evident every year. Changes to the level of these support activities typically happens with major shifts in enrolment or programming and will not be solely attributed to the B.Sc. (An. Biosc.) students.

University Services will be supported by central allocation of tuition revenue (currently 15%) and any potential impact of enrolment on the University funding mechanism.

3. Enrolment (tuition revenue)

When the B.Sc. (An. Biosc.) reaches steady state in 2016/17 the incremental enrolment is projected to be 47 FLE at the University level, generating approximately \$258,000 in tuition revenue.

Projected Incremental Enrolment

Course enrolment (3 cue)	<u>2013/14</u>	<u>2014/15</u>	<u>2015/16</u>	<u>2016/17</u>
AgBio courses	30.00	86.70	139.62	197.41
Other college courses	120.00	189.30	242.22	273.34
Total incremental courses	150.00	276.00	381.84	470.75
Total FLE	15	28	38	47

Tuition revenue

Agriculture and Bioresources	\$15,030	\$44,740	\$74,210	\$108,073
Other colleges	\$60,120	\$97,684	\$128,743	\$149,640
Total tuition	\$75,150	\$142,424	\$202,952	\$257,713

Only students expected to be new to the University are counted for incremental tuition.

4. Additional Comments

The attached appendices provide the detailed assumptions and calculations supporting this budget.

Appendix	Document	Description
9	Budget Summary	Summary of student enrolment, incremental class enrolment, tuition and cost projections
10	Process and Assumptions	General process and assumptions relating to student population and source, class capacity, class enrolment, and incremental revenue and costs.
Other Documents Available on Request:		
	Program Enrolment	Calculation of student intake and retention over the 4 year program
	Incremental Class Enrolment Generating New Tuition	Summary of change in student class enrolments for the purpose of tuition calculations
	Incremental Class Enrolment	Summary of change in student class enrolment related to program curriculum
	Class Distribution	Detailed projection of ANBI student enrolment in program classes
	Class Capacity	Detailed projection of incremental students per class, total College students per class, and capacity constraint

Date: January 18, 2012

Financial Analyst (assisting in form preparation

on behalf of the Financial Services Division): Laurel Sawatzki

Faculty member (for the sponsoring college/dept): Andrew Van Kessel

List of Appendices

Appendix 1: *Planning and Priorities Committee of Council response to NOI for B.Sc. (An. Biosc.)*

Appendix 2: *Cross Department and College Consultations*

Appendix 3: *Disciplinary Mapping – Skills and Knowledge Areas attained through B.Sc. (An. Biosc.) course offerings*

Appendix 4: *Disciplinary Mapping – Skills required for career paths identified for B.Sc. (An. Biosc.) graduates*

Appendix 5: *B.Sc. (An. Biosc.) program illustration by term*

Appendix 6: *List of Restricted Electives including course titles*

Appendix 7: *Statement from Dean Buhr, College Agriculture and Bioresources*

Appendix 8: *Statement from Professor Van Kessel, Head, Animal and Poultry Science*

Appendix 9: *Budget summary*

Appendix 10: *Budget process assumptions*

Appendix 1: Planning and Priorities Committee of Council response to NOI for B.Sc. (An. Biosc.)

Appendix 1: Planning and Priorities Response to NOI for B.Sc. (AnBio)



MEMORANDUM

TO: Andrew Van Kessel, Head, Animal and Poultry Science
Dan Pennock, Associate Dean (Academic), College of Agriculture and
Bioresources

FROM: Bob Tyler, Chair, Planning and Priorities Committee of Council

DATE: November 21, 2011

RE: **Notice of Intent for a Bachelor of Science in Animal Bioscience**

Thank you for meeting with the Planning and Priorities Committee on November 16, 2011, to discuss the Notice of Intent to offer a B.Sc. in Animal Bioscience.

The Committee viewed the program as relevant to the College's mandate and noted that no new resources are required to offer the proposed program, as the teaching resources associated with the new faculty hires in the Department of Animal and Poultry Science are already in place. The program will diversify the College's program offerings and has the potential to increase enrolment through the recruitment of urban students interested in the areas of companion animal care, animal biotechnology and the environment. The program is also designed to support the retention of those students who elect to transfer out from the BSA program after determining that a production-based agriculture degree does not match their aspirations.

The program is anticipated as being attractive to pre-Veterinary Medicine students, as related career options exist in the veterinary pharmaceutical sciences and the prerequisites for the DVM program can be met through the proposed program. Additional consideration is suggested to apply the same strategy to the MD program, potentially matching pre-Medicine prerequisites to attract a broader group of students to the program. Given the existing relationship between the BSA and B.Comm. programs, which facilitates students transferring from the BSA to the B.Comm., ensuring that the same relationship exists between the proposed B.Sc. and the B.Comm. is suggested.

The proponents are reminded to ensure that consultations take place with all relevant academic units as the formal proposal is developed, and that letters of support are obtained. This will facilitate the approval process.

Continued...2/

Andrew Van Kessel, Dan Pennock
Notice of Intent for a B.Sc. Animal Bioscience

Page 2

If you have any questions regarding the suggestions conveyed above, please do not hesitate to contact me.

Sincerely,



-
- c Mary Buhr, Dean of Agriculture and Bioresources
Brett Fairbairn, Provost and Vice-President Academic and PCIP Chair
Len Proctor, Chair, Academic Programs Committee
Russ Isinger, Registrar

Appendix 2: Cross Department and College Consultations



Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. Barry Blakley,
Professor and Head
Dept. of Veterinary Biomedical Sciences
Room 1303
Western College of Veterinary Medicine

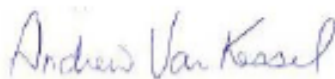
Dear Dr. Blakley,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

Three existing courses offered by Veterinary Biomedical Sciences are proposed as required courses in the new program. They include VBMS 314.3 Comparative Anatomy of Domestic Animals (Term 1), VBMS324 Animal Physiology I (Term 1) and VBMS325 Animal Physiology II (Term 2). Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

I would be pleased to discuss the program with you further to address any concerns. A letter addressed to me indicating your support for the program would be highly appreciated.

Sincerely,

A handwritten signature in blue ink that reads "Andrew Van Kessel".

Andrew Van Kessel
Professor and Head



UNIVERSITY OF
SASKATCHEWAN

Western College of
Veterinary Medicine
February 9, 2012

Veterinary Biomedical Sciences

52 Campus Drive
Saskatoon SK S7N 5B4 Canada
Telephone: (306) 966-7347
Facsimile: (306) 966-7376

Dr. Andrew Van Kessel
Professor and Head
Department Animal and Poultry Science
51 Campus Drive
University of Saskatchewan

Dear Dr. Van Kessel:

RE: Development of the Bachelor of Science (B.Sc.) In Animal Bioscience

In response to your recent request concerning the development of this new program, the matter was discussed at the College and Departmental levels. There was enthusiastic support for the new program. The Department of Veterinary Biomedical Sciences currently provides three courses for students in your BSA program including VBMS 314.3, VBMS 324.3 and VBMS 325.3. With increased enrollment anticipated in these courses, additional resources related to laboratory equipment and laboratory space are expected. Depending upon minor adjustments made to the course content, to meet the requirements of two degree programs, instructional and technical resources may also be required.

In spite of the resource issues which are currently under discussion, they and are not considered a major obstacle for implementation of the new program. The Department of Veterinary Biomedical Sciences fully supports the establishment of this new degree program.

Sincerely,

Barry Blakley, D.V.M. Ph.D.
Professor and Head
Department of Veterinary Biomedical Sciences

BB:smr

copy: Dean Doug Freeman, WCVM
Associate Dean (Academic) Bruce Grahn, WCVM



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 16, 2011

Dr. P. Bretscher
Professor and Head
Department of Microbiology and Immunology
HLTH A302
107 Wiggins Road

Dear Dr. Bretscher,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

Three existing courses offered by the Department of Biochemistry are proposed as required courses in the new program. They include BMSC 200.3 Biomolecules (Term 1) and BMSC 230.3 Metabolism (Term 2). BMSC210.3 Microbiology or FABS212 Agri-Food Resources Microbiology will be accepted as meeting a requirement for 3 credit units of microbiology. Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

A handwritten signature in blue ink that reads "Andrew Van Kessel".

Andrew Van Kessel
Professor and Head

Zink, Melissa

From: Peter Bretscher <peter.bretscher@usask.ca>
Sent: Friday, December 23, 2011 11:53 AM
To: Zink, Melissa
Cc: Peter Bretscher
Subject: Re: Bachelor of Science in Animal Biosciences

Hello Andrew,

Thank you for your letter and consultation over your proposal for a new BSc in Animal Bioscience, under the auspices of the College of Agriculture and Bioresources. This email attempts to encapsulate our recent telephone conversation. My response was made after getting advice from our Chair of the departmental Undergraduate Affairs Committee.

I noted that BMSC 210 is actually offered by the Department of Microbiology and Immunology, and outlined the academic reasons for the BMSC common core, namely that students entering the Biomedical Sciences are now not at a disadvantage if they only choose their major on entering the third year, in contrast to their second year, as in the past. We ourselves do not regard FABS 212.3 as equivalent to BMSC 210, because there is more immunology and bacterial genetics in BMSC 210, suitable as a foundation for upper year classes, though we can give permission to individuals who have taken FABS 212.3 to take our higher level MCIM classes. BMSC 210 is presently oversubscribed, due to space limitations of the lecture theatre, and the quota filled on a first come basis. You told me that MCIM 321.2, Principles of Immunology, was an elective, which seems appropriate. One fact I forgot to mention is that there is a Committee, the BMSC Undergraduate Program Committee, of whom Mary Pato, Biochemistry, is Chair. She could be consulted. However, if you are consulting Bill Roesler as Chair of Biochemistry, that should be sufficient.

Best wishes of the season.

Peter Bretscher

On 16-Dec-11, at 1:00 PM, Zink, Melissa wrote:

Please see attached letter from Dr. Andrew Van Kessel.

Melissa Zink
Animal and Poultry Science
6D34 Agriculture
966-4146
melissa.zink@usask.ca

<Animal Bioscience Letter- Dr P. Bretscher 06-16-2011.pdf>



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. Bruce Coulman,
Professor and Head
Department of Plant Sciences
Room 4D36.3
Agriculture Building

Dear Dr. Coulman,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

One existing course offered by the Department of Plant Sciences is proposed as a required course in the new program. The course is PLSC 314.3 Statistical Methods (Term 1). Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

Andrew Van Kessel
Professor and Head

Zink, Melissa

From: Zink, Melissa
Sent: Friday, December 16, 2011 2:30 PM
To: Van Kessel, Andrew
Subject: FW: Bachelor of Science in Animal Bioscience

Melissa Zink
Animal and Poultry Science
6D34 Agriculture
966-4146
melissa.zink@usask.ca

From: Coulman, Bruce
Sent: Friday, December 16, 2011 2:29 PM
To: Zink, Melissa
Subject: RE: Bachelor of Science in Animal Bioscience

Andrew/Melissa,

This new degree sounds like an excellent initiative.

Regarding PLSC 314, I don't think that additional students from this program will have any immediate resource implications. My concern would be that PLSC 314 sometimes runs close to capacity because of classroom size. We may have to consider enrolment limits for certain programs in other Colleges.

Regards,

Bruce

From: Zink, Melissa
Sent: December-16-11 10:30 AM
To: Coulman, Bruce
Subject: Bachelor of Science in Animal Bioscience

Please see attached letter from Dr. Andrew Van Kessel

Melissa Zink
Animal and Poultry Science
6D34 Agriculture
966-4146
melissa.zink@usask.ca



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. Jack Gray,
Professor and Head
Department of Biology
Room 324
112 Science Place

Dear Dr. Gray,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially human medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

Two existing courses offered by the Department of Biology are proposed as required courses in the new program. They include BIOL120.3 Nature of Life (Term 1), BIOL224.3 Animal Body Systems (Term 2). We also anticipate students in the program would be interested in upper year elective course offered by the Department of Biology including as restricted electives. I am writing to formally request you identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

I would be pleased to meet with you to discuss the program further, including addressing resource issues, as well as scheduling and refining opportunities in both Departments for elective offerings. Following this, a letter addressed to me indicating your support for the program would be highly appreciated.

Sincerely,

Andrew Van Kessel
Professor and Head



Andrew Van Kessel
Professor and Head
Department of Animal and Poultry Science
College of Agriculture And Bioresources

Department of Biology

112 Science Place
Saskatoon SK S7N 5E2 Canada
Telephone: (306) 966-4399
Facsimile: (306) 966-4461

Dear Andrew,

Thank you for the meeting regarding the proposed BSc in Animal Bioscience. Both Jack Gray and I found it very useful. After meeting with you I arranged a meeting of the Biology Undergraduate Affairs Committee to discuss the proposal. In general the committee recognized the desirability of such a program and were supportive of the concept. Some of the major concerns echoed some topics brought up when Jack and I met with you.

The Biology Undergraduate Affairs Committee (UAC) identified these challenges, concerns and opportunities:

- Crossover of students between the Arts & Science and Agriculture and Bioresources for senior course offerings was seen as beneficial. As the ANBI program is developing, both Departments should look into alternate prerequisites (BIOL/ANSC/ANBI) to facilitate this. As an example, the proposed ANBI 420.3 course may be an attractive option for Biology majors and we are encouraged by Dr. Hogan's willingness to consider Biology courses as prerequisites. Further, as some of the existing ANSC courses are revised we would welcome the opportunity to review whether these could play a role in the Biology major, opening them up to Arts & Science students. I'm confident that continued discussion will prove useful.
- As we discussed in our meeting, enrolment pressure on Biology 120.3, The Nature of Life, and Biology 224.3, Animal Body Systems, is very high. These lab-based courses have been extremely successful and are in high demand for students in several colleges. The Department and College are aware of this and discussions around improving access are ongoing. Any additional student demand for either of these courses beyond existing commitments will require further discussion around lab scheduling and resourcing. We don't want access to Biology courses to be a bottleneck for students in any College and we will be sure to include your students' needs in future discussions, but cannot commit to any additional space at this time.
- After looking at the course sequence. We were not able to discern the reason that Biology 224.3 could not be taken in the second year. There is no course in term 1 of year 2 that requires Biology 224.3. The proposal acknowledges that students in the College of Agriculture taking this course in term 2, generally first year students, do not perform as well as students in term 1, who must have taken Biology 120.3 the previous year as a prerequisite. Given the enrolment pressure identified above the Department of Biology would like to see every student enrolled do

well in the course. Students who have to re-take Biology 224.3 place added need on this course. We suggest looking at the course sequence to determine if Biology 224.3 could be moved to your students' second year.

- The Biology UAC also noted that Biology 226.3, Genes to Genomics, was not a program requirement, but Biology 316.3, Molecular Genetics of Eukaryotes, which requires Biol 226.3 as a prerequisite, is a restricted elective. We also note that the Planning and Priorities Committee identified meeting pre-professional (Veterinary Medicine and Medicine) entry requirements as beneficial. Our committee acknowledged that ANSC 313.3 is accepted by the U of S as meeting the genetics requirement for application for Vet Med here in Saskatoon, but were uncertain if this would be a disadvantage to students who might apply to professional schools outside of Saskatchewan. The committee suggests clarifying how BIOL 226.3 and 316.3 fit into the proposed ANBI program.
- The positioning of this program was also discussed. The committee was supportive of a domestic animal program to complement the livestock production-oriented Animal Science major. The UAC was concerned that the term Animal Biology had been used as a field of specialization. As you note in the proposal the Department of Biology provides foundational programming in animal biology. The Department also has a strong animal research component and strength in senior animal-related courses. The Department of Biology views "Biology" as a broad, encompassing term that crosses scales from molecular biology to population, community and landscape-level research. We also do offer senior courses in the biology of various animal groups that include molecular, physiological, behavioural and ecological aspects. In this vein, we see the proposed Animal Bioscience program addressing an applied aspect of Animal Biology. However, it does not reflect this field as a whole. We suggest considering an alternate term.

In positioning the Animal Bioscience major we also noted that on the surface the structure of the degree is remarkably similar to the B.S.A. Animal Science major, with certain course substitutions. While we do recognize the difference in emphasis, we were not sure that a BSc in Animal Bioscience and BSA in Animal Science reflect this emphasis. As stated above, the committee did not favour the use of the word *Biology*, but suggested that *Domestic Animal Bioscience* or *Domesticated Animal Bioscience* might help incoming students.

It was also suggested that your proposal specify possible career paths other than graduate school or veterinary medicine that an Animal Bioscience graduate might pursue to help distinguish this program from both the B.S.A in Animal Science as well as the BSc in Biology.

- We would also like to note that at present BIOL 312.3, Life in the North, is not being regularly offered by the Department and may not be a useful inclusion as a restricted elective. We also note that BIOL 436.3, Parasitology, has BIOL 121.3 and 9 cu of Biology as it's prerequisite and

that BIOL 121.3 is not included in the core program and with the current structure many students will only have taken BIOL 120.3 and BIOL 224.3, likely limiting student access. Likewise, TOX 301.3 also requires BIOL 121.3. I'd be happy to discuss the role of this course in your programs should you wish.

Finally, while not discussed by the UAC, we remain interested in evaluating possible crossover between the 300-level animal physiology courses in your program and ours to improve access to senior course offerings in both Departments. It occurs to me that this may also provide more flexibility for students in the Agricultural Biology program to move to the Animal Bioscience program should it suit their needs.

I'm happy to meet to discuss any of the above further or to explore other ideas.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chris Todd', with a stylized flourish at the end.

Chris Todd
Chair, Biology Undergraduate Affairs Committee

cc. Dr. J. Gray, Acting Head, Biology
Dr. P. Bonham-Smith, Acting Vice-Dean, Arts and Science College



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. George Khachatourians
Professor and Head
Department of Food and Bioproduct Sciences
Room 6E08
Agriculture Building

Dear Dr. Khachatourians,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

One existing course offered by Food and Bioproduct Sciences is proposed as required course in the new program. The course is FABS212.3 Agri-Food and Resources Microbiology (Term 1). Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

Andrew Van Kessel
Professor and Head



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Food & Bioproduct Sciences

51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-5025
Facsimile: (306) 966-8898

January 11, 2012

Dr. Andrew Van Kessel
Professor and Head
Department of Animal and Poultry Science
Room 6D34
Agriculture Building
51 Campus Drive
Saskatoon, SK S7N 5A8

Dear Dr. Van Kessel:

The development of a Bachelor of Science in Animal Bioscience is very timely and should be an exciting new option to attract urban students to our college.

Your inclusion of FABS 212.3 Agri-Food and Resources Microbiology as a required course should not pose any significant demand on resources in the short term. We recognize that the inclusion of this course is important to the Animal Bioscience program as it will provide a foundation in the general biology of microorganisms, with emphasis on those of agriculture, food and environmental importance. In addition, it will be positive for enrollment numbers for our department.

As this time, there are some uncertainties as to the impact of TABBS on course development and to cost recovery for laboratory portions of FABS 212. We will continue to monitor resource needs and will be in contact should conditions change.

Sincerely,

Phyllis J. Shand
Professor and Head



Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. David Palmer,
Professor and Head
Department of Chemistry
Room 259
Thorvaldson Building

Dear Dr. Palmer,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

Two existing courses offered by the Department of Chemistry are proposed as required courses in the new program. They include CHEM 112.3 General Chemistry (Term 1), CHEM 250.3 Organic Chemistry (Term 2). Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

A handwritten signature in blue ink that reads "Andrew Van Kessel".

Andrew Van Kessel
Professor and Head



MEMORANDUM

TO: Andrew van Kessel, Head, Dept. of Animal and Poultry Science

FROM: David Palmer, Head, Dept. of Chemistry

DATE: January 23, 2012

RE: **B.Sc. in Animal Bioscience**

Dear Andrew,

The Chemistry Department is delighted to hear about your new program offering students a BSc in Animal Bioscience. The Chemistry Department can accommodate the expected number of extra students (ca. 20) in the three Chemistry courses that are described in the program (Chem 112, Chem 115 and Chem 250) without need of extra resources. We are assuming at this time that no changes need to be made regarding reserved seating during registration.

We look forward to seeing students in the new program in our courses. Many thanks for consulting with us and I wish you great success with this new endeavor.

A handwritten signature in dark ink, appearing to be "DP", written over a light blue horizontal line.

David Palmer, Head
Department of Chemistry



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. W.J. Roesler
Professor and Head
Department of Biochemistry
Rm A3 Health Science Building
107 Wiggins Road

Dear Dr. Roesler,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

Three existing courses offered by the Department of Biochemistry are proposed as required courses in the new program. They include BMSC 200.3 Biomolecules (Term 1) and BMSC 230.3 Metabolism (Term 2). BMSC210.3 Microbiology or FABS212 Agri-Food Resources Microbiology will be accepted as meeting a requirement for 3 credit units of microbiology. Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

Andrew Van Kessel
Professor and Head

Zink, Melissa

From: Mary Pato <mdp325@mail.usask.ca>
Sent: Thursday, December 22, 2011 9:26 AM
To: Zink, Melissa
Cc: Van Kessel, Andrew; Ovsenek, Nicholas; Bill Roesler
Subject: Bachelor of Science in Animal Bioscience

Hi Melissa,

Dr. Roesler has forwarded to me your message with the letter of Dr. Andrew Van Kessel regarding the proposed B. Sc. in Animal Bioscience program which will require the biochemistry courses BMSC 200.3 and BMSC 230.3. Both courses are lecture courses taught to a large number of students. BMSC 200 is offered in 2 sections in term 1, 1 section in term 2 and sometimes 1 section in the summer. This year, there are about 225 students in each section (1, 2 and 3). An additional 20 students from the proposed program could be accommodated in these sections. There are 2 sections in BMSC 230 offered in term 2. Section 1 is usually full (350 students this year) while section 2 is nearly full (212 students). We suggest that if possible you should ask your students to enrol in BMSC 230 section 2. Because these courses are lecture courses there will be no resource issue unless the enrolment exceeds the capacity of the lecture rooms available, and another section has to be offered.

If you have any question about this matter, please do not hesitate to contact me.

Mary Pato
Chair, Undergraduate Affairs Committee

Mary D. Pato, Ph. D.,
Professor, Department of Biochemistry,
College of Medicine,
University of Saskatchewan,
107 Wiggins Road, Saskatoon, SK,
CANADA S7N 5E5

Telephone 306-966-4376
Facsimile 306-966-4390



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Debora Rolfes
Ron & Jane Graham Centre
Room 2A20
College of Engineering

Dear Debora Rolfes,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

RCM300 Rhetorical Communication (Term 2) is a course offered by the Ron and Jane Graham Centre that is proposed as required courses in the new program. Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

Andrew Van Kessel
Professor and Head

January 9, 2012

Andrew Van Kessel
Professor and Head
Department of Animal and Poultry Science
6D34 Agriculture Building

Dear Dr. Van Kessel:

Re: Proposed Bachelor of Science (B.Sc.) in Animal Bioscience

Congratulations on the development of a new program. At the Graham Centre, we enjoy working with students from the College of Agriculture and Bioresources, and we look forward to adding students studying animal bioscience.

Our only concern is that we already have too many students to handle in the second (winter) term and are looking to balance the enrolment in RCM 300 between fall and winter terms. Twenty extra students is the equivalent of one full section; we do not have the instructional staff to add a section in the winter term. If you require the students in this new program to take RCM 300 in the fall term, we should have no problem handling the increased load.

Thank you for consulting us about resource issues; we look forward to meeting your new students.

Sincerely,

Debora Rolfes
Coordinator, RCM 300



UNIVERSITY OF
SASKATCHEWAN

College of Agriculture
and Bioresources

Department of Animal and Poultry Science
6D34
Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4128
Facsimile: (306) 966-4151

December 12, 2011

Dr. Raj Srinivasan
Professor and Head
Department of Math
Room 140
McLean Hall

Dear Dr. Srinivasan,

The Department of Animal and Poultry Science is developing a new Bachelor of Science (B.Sc.) in Animal Bioscience that will provide students with a strong foundation in applied domestic animal biology (animal metabolism, genetics, physiology, nutrition, behavior, care, social and environmental impact) to work in fields outside of agriculture including biomedical sciences, companion, equine and research animal care, animal health, environmental sciences, and government regulation. The new B.Sc. (Animal Biosciences) is consistent with similar programs offered in other animal science departments in Canada that have been successful in attracting significant student enrolment, particularly among an urban cohort of students interested in domestic animals but not necessarily food animal agriculture. Students entering the program will be able to meet the prerequisite for application to veterinary and potentially medicine programs. We anticipate the B.Sc. (Animal Bioscience) will attract 20 students in each of the 4 years of the program (80 students total).

One of three existing courses offered by the Department of Math is proposed to meet requirement for 3 credit units of mathematics in the new program. They include MATH104.3 Elementary Calculus (Term 1), MATH 110 Calculus I (Term 1) and MATH 125 Mathematics for the Life Sciences (Term 1). Please identify any resource issues that must be addressed in order to meet additional enrolment demand in these course offerings.

Please indicate any concerns regarding the program in correspondence to me before January 13, 2012. If no response is provided by this date we will assume that no resource issues have been identified.

Sincerely,

Andrew Van Kessel
Professor and Head

Van Kessel, Andrew

From: Raj Srinivasan [raj@math.usask.ca]
Sent: Tuesday, December 20, 2011 1:51 PM
To: Van Kessel, Andrew
Cc: Raj Srinivasan
Subject: Resources for Math course

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Andrew:

I do not think I need any additional faculty resources to accommodate 20 students per year in to Math 104/Math 125/Math 110. However, I need resources for marking and tutorial assistants. Math 104 does not have a tutorial, so need for tutorial assistant. Math 125 and Math110 have 90 minute tutorial. I might be able to come up with the exact cost of marker and tutorial assistant in the new year.

Please send me a reminder.

Raj

Appendix 3: Disciplinary Mapping – Skills and Knowledge Areas attained through B.Sc. (An. Biosc.) course offerings

Skills	Year of Program	Courses
oral communication	2	RCM 300 Rhetorical communication
	3	ANBI 375 Animals and the environment (debate)
	4	ANSC 430 Intensive Feedlot Production
literature comprehension	3	ANBI 375 Animals and the environment (paper)
	4	ANBI 492 Thesis
scientific writing	1	AGRC 112 Food/Animal Science (term paper)
popular/extension writing	1	ENG 1xx
	2	RCM 300 Rhetorical communication
	4	ANSC 440 Monogastric Animal Production II
computer literacy	1	ANBI 110 Domestic Animal Biology
	2	ANSC 313 Animal breeding and genetics
laboratory skills	3	ANSC 315 Animal and Poultry Nutrition
	1,2	Chemistry labs
animal handling/field	2	ANSC 212 Livestock and Poultry Production
	3	ANSC 315 Animal and Poultry Nutrition
	4	ANSC 430 Intensive Feedlot Production
	4	ANSC 440 Monogastric Animal Production II
problem solving/ critical thinking	3	ANBI 360 Canine and Feline Science
	4	ANBI 470 Applied Animal Biotechnology
	4	ANSC 460 Dairy (solve farm problem)
marketing/business	3	ANBI 360 Canine and Feline Science
	3	ANBI 320 Equine Science
	4	ANSC 410 Cow-Calf Management
work independently	4	ANBI 492 Thesis
group/team work	1	AGRC 112 Food/Animal Science
	2	ANSC 313 Animal breeding and genetics
	4	ANSC 410 Cow-Calf Management
integrity/ethical behaviour	4	ANBI 470 Animal Biotechnology
Biohazard awareness	3	ANSC 315 Animal and Poultry Nutrition
	4	ANBI 470 Animal Biotechnology
time management	4	ANBI 492 Thesis

Appendix 3: Disciplinary Mapping – Skills and Knowledge Areas attained through B.Sc. (An. Biosc.) course offerings-continued

Knowledge Areas	Year of Program	Course
biology	1	BIOL 120.3 Nature of Life
	1	ANBI 110 Domestic Animal Biology
	1	BIOL 224 Animal Body Systems
animal management	2	ANSC 212 Livestock and Poultry Production
	3,4	<i>Species specific courses</i>
reproduction	1,2	ANSC 212 Livestock and Poultry Production
	3	VBMS 325 Animal Physiology II
genetics	2	ANSC 313 Animal breeding and genetics
	4	ANBI 470 Applied Animal Biotechnology
physiology	3	VBMS 324 Animal Physiology I
	3	VBMS 325 Animal Physiology II
endocrinology	3	VBMS 325 Animal Physiology II
	4	ANBI 420 Comparative Endocrinology
environment	1	AGRC 112 Food/Animal Science
	3	ANBI 375 Animals and the environment
math	1	MATH 104 Calculus
basic statistics	2	PLSC 314 Statistical Methods
	4	ANSC 313 Animal breeding and genetics
inorganic chemistry	1	CHEM 112 General Chemistry
	1	CHEM 115
organic chemistry	1	CHEM 250 Organic Chemistry
biochemistry	2	BMSC 200 Biomolecules
	2	BMSC Metabolism
microbiology	2	BMSC 210 Microbiology or FABS 212
immunology	1	ANBI 110 Domestic Animal Biology
	4	ANBI 470 Applied animal biotechnology
digestion/nutrition	2	ANSC 212 Livestock and Poultry Production
	3	ANSC 315 Animal and Poultry Nutrition
	3	<i>Species specific courses</i>
anatomy	3	VBMS 314 Comparative anatomy
disease assessment	4	VLAC 411 or VTPA 412
animal ethics	3	ANBI 375 Animals and the environment (paper)
animal behavior/welfare	1	AGRC 112 Food/Animal Science
	4	ANBI 411 Behaviour of Domestic Animals

Appendix 4: Disciplinary Mapping – Skills required for potential career paths identified for B.Sc. (An. Biosc.) graduates

Potential Career	Required skills/knowledge areas		
Pharmacology representative	Anatomy Basic statistics Biochemistry Biology Computer literacy Digestion/nutrition Endocrinology	Group/team work Immunology Inorganic chemistry Integrity/ethical behaviour Literature comprehension Marketing / business Math	Oral communication Organic chemistry Physiology Popular/extension writing Problem solving/critical thinking Scientific writing
Research technician	Animal behaviour/welfare Animal handling/field training Basic statistics Biochemistry Biohazard awareness Biology Computer literacy Digestion/nutrition Disease assessment	Endocrinology Environment Group/team work Immunology Inorganic chemistry Integrity/ethical behaviour Laboratory skills Literature comprehension Math	Microbiology Oral communication Organic chemistry Physiology Problem solving/critical thinking Reproduction Scientific writing
Companion Animal/Pet Industry	Anatomy Animal behaviour/welfare Animal handling/field training Basic statistics Biochemistry Biohazard awareness Biology Computer literacy	Digestion/nutrition Disease assessment Endocrinology Environment Genetics Group/team work Inorganic chemistry Integrity/ethical behaviour	Math Oral communication Organic chemistry Physiology Problem solving/critical thinking Reproduction

Appendix 4: Disciplinary Mapping – Skills required for potential career paths identified for B.Sc. (An. Biosc.) graduates - Continued

Potential Career	Required skills/knowledge areas		
Laboratory Animal	Anatomy	Digestion/nutrition	Literature comprehension
	Animal behaviour/welfare	Disease assessment	Math
	Animal handling/field training	Endocrinology	Oral communication
	Basic statistics	Genetics	Organic chemistry
	Biochemistry	Group/team work	Physiology
	Biohazard awareness	Inorganic chemistry	Problem solving/critical thinking
	Biology	Integrity/ethical behaviour	Scientific writing
	Computer literacy	Laboratory skills	
Regulatory Government	Animal behaviour/welfare	Digestion/nutrition	Math
	Basic statistics	Disease assessment	Oral communication
	Biohazard awareness	Environment	Popular/extension writing
	Biology	Group/team work	Problem solving/critical thinking
	Computer literacy	Literature comprehension	Scientific writing
Environmental (animal related)	Anatomy	Disease assessment	Literature comprehension
	Animal behaviour/welfare	Endocrinology	Organic chemistry
	Basic statistics	Environment	Organization skills
	Biochemistry	Genetics	Physiology
	Biohazard awareness	Group/team work	Popular/extension writing
	Biology	Inorganic chemistry	Problem solving/critical thinking
	Chemistry	Integrity/ethical behaviour	
Pre-vet	Computer literacy	Laboratory skills	
	Basic statistics	Integrity/ethical behaviour	Physics
	Biochemistry	Math	Physiology
	Biology	Microbiology	Oral communication
	Genetics	Oral communication	Popular/extension writing
	Inorganic chemistry	Organic chemistry	Integrity/ethical behaviour

Appendix 5: B.Sc. Animal Bioscience program – suggested scheduling by term

B.Sc. Animal Bioscience			
First Year (30 Credits)			
Term 1		Term 2	
ANBI 110.3	Domestic animal biology	AGRC 112.3	Agricultural Science II (Food/Animal Science)
BIOL 120.3	Nature of life	BIOL 224.3	Animal body systems
CHEM 112.3	General chemistry	CHEM 115.3	General Chemistry
MATH 104.3, 110.3 or 125.3	"Calculus"	ENG 1xx.3*	See below
Humanity	Can include Term 2 ENG 110.6	Humanity	
Total Credits	30		
Second Year (30 Credits)			
Term 1		Term 2	
ANSC 212.3	Livestock and Poultry Production	ANSC 313.3	Animal breeding and genetics
BMSC 200.3	Biomolecules	BMSC 230.3	Metabolism
CHEM 250.3	Organic Chemistry	PLSC 314.3	Statistical Methods
FABS 212.3 or BMSC 210.3	"Microbiology"	Open elective	
RCM 300.3	Rhetorical communication	Restricted elective	
Total Credits	30		
Third Year (30 Credits)			
Term 1		Term 2	
ANSC 315.3	Animal and Poultry Nutrition	ANBI 375.3	Animals and the environment
VBMS 314.3	Comparative anatomy	VBMS 325.3	Animal physiology II
VBMS 324.3	Animal Physiology I	Restricted Elective	
Restricted elective		Open elective	
Open elective		Open elective	
Total Credits	30		
Fourth Year (30 Credits)			
Term 1		Term 2	
ANBI 492.3 or 494.6	Thesis	VLAC 411 or VTPA 412	Animal or poultry diseases
ANBI 470.3	Applied animal biotechnology	ANBI 420.3	Comparative Endocrinology
Restricted elective		ANBI 411.3	Animal Behaviour
Restricted elective		Restricted elective	
Open elective		Open elective	
Total Credits	30		
Overall Total Credits 120			
*ENG 111.3, 112.3, 113.3, 114.3 or ENG 110.6			
Restricted electives-18 cu including a minimum of 6 cu species courses listed below			
Species courses = ANBI 320 (horses), 360 (dogs/cats), ANSC 340 (swine), 410 (Cow/Calf), 430 (Feedlot), 440 (Poultry), 460 (Dairy)			
Summary			
28 X 3 required courses = 84 cu			
6 X 3 Restricted electives = 18 cu			
6 X 3 Open electives = 18 cu			
Total 120 cu			

Appendix 6: Course titles for restricted electives in the Animal BioScience program.

Restricted Elective-Course Titles

Discipline Specific Courses

ANSC 301.3 Animal Production Tour
BIOC 310.3 Proteins and Enzymes
BIOC 311.3 Introductory Molecular Biology
BIOC 435.3 Intermediary Metabolism
BIOC 436.3 Advanced Molecular Biology
BIOL 430.3 Neurobiology of Behaviour
BINF 210.3 Introduction to Bioinformatics Applications
BMSC 220.3 Cell Biology
BMSC 240.3 Laboratory Techniques
FABS 325.3 Food Microbiology and Safety
FABS 430.3 Environmental Microbiology
FABS 450.3 Anaerobic and Rumen Microbiology
MCIM 209.3 Medical Virology
MCIM 308.3 Medical Bacteriology
MCIM 321.3 Immunology
PCOL 350.6 General Pharmacology
PHYS 115.3 Physics and the Universe
PLSC 422.3 Rangeland Management
RCM404.3 Leadership as communication
RRM 312.3 Natural Resource Management and Indigenous Peoples
TOX 300.3 General Principles of Toxicology
TOX 402.3 Systemic Toxicology
VLAC 411.3 Diseases of Livestock
VTPA 412.3 Diseases of Poultry

Animal Species Specific Electives

ANBI 320.3 Equine Science
ANBI 360.3 Canine and Feline Science
ANSC 340.3 Monogastric Animal Production I
ANSC 410.3 Cow Calf Management
ANSC 430.3 Intensive Management of Beef Cattle
ANSC 440.3 Monogastric Animal Production II
ANSC 460.3 Intensive Management of Dairy Cattle

Appendix 7: Statement from Dean Buhr, College Agriculture and Bioresources

The College of Agriculture and Bioresources enthusiastically supports the establishment of a Bachelor of Science in Animal Biosciences degree program and has committed that the necessary resources will be available. The establishment of this program will allow us to keep pace with our competitor institutions and maintain our ability to attract students from across Western Canada.

The B.Sc. (Anbiosc.) degree will appeal to a broader spectrum of students and will better attract urban students compared to the existing Animal Science major in the B.S.A. degree.

Development of the B.Sc. (Anbiosc.) degree is a cornerstone of the college's academic plan for 2012-2016. College Faculty unanimously approved the proposal March 8, 2012 for implementation in the 2013-2014 admission cycle.

Appendix 8: Statement from Professor Van Kessel, Head, Animal and Poultry Science



Department of Animal and Poultry Science
6D34 Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: (306) 966-4136
Facsimile: (306) 966-4151

March 1, 2012

Mary Buhr
Dean and Professor
College of Agriculture and Bioresources

Dear Dr. Buhr:

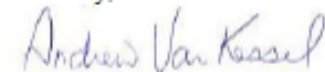
Faculty of the Department of Animal and Poultry Science have developed a novel B.Sc. in Animal Bioscience at the University of Saskatchewan to provide students with career opportunities in domestic animal-related fields and to increase the representation of urban students in programs offered by our Department. The new degree will attract new students to the University of Saskatchewan and College of Agriculture and Bioresources. On January 25, 2012, Animal and Poultry Science faculty fully endorsed the B.Sc. (Animal Bioscience) proposal.

The new degree maximizes use of faculty expertise and resources in animal nutrition, physiology, genetics and management and provides enhanced undergraduate teaching opportunity for two new faculty with expertise in wildlife-agriculture interactions and ecotoxicology. The degree can be offered with existing faculty plus sessional lecturer support to teach ANBI 320 Equine Sciences (replaces ANSC250 and ANSC350) every year. Additional new resource requirements are limited to supplies and teaching assistant support associated with incremental enrolment for laboratories in existing courses plus two new (n=2) courses.

We have conducted extensive cross college consultations in developing the new degree. WCVI has indicated their continued "enthusiastic" support for cross college teaching between Animal and Poultry Science and Veterinary programs. Similarly, the Department of Biology is also supportive of the program concept and in developing greater cross departmental access to senior courses. While some resource issues have been identified associated with incremental enrolment in required courses offered outside AgBio we are confident these can be addressed.

Animal and Poultry Science is excited to be able to add this program to the array of undergraduate program offerings in the College of Agriculture and Bioresources.

Sincerely,

A handwritten signature in blue ink that reads "Andrew Van Kessel".

Andrew Van Kessel
Professor and Head

Appendix 9: Budget Summary

	Note	<u>2012/13</u>	<u>2013/14</u>	<u>2014/15</u>	<u>2015/16</u>	<u>2016/17</u>
<u>Student Data (FTE)</u>						
Total Program enrolment			20.00	36.80	50.91	62.77
New AgBio students			15.00	27.60	38.18	47.07
New UofS students			15.00	27.60	38.18	47.07
<u>Course Data (3 cue)</u>						
Incremental Courses - AgBio			30.00	86.70		
Incremental Course - Other			120.00	189.30	242.22	273.34
Total incremental courses			150.00	276.00	381.84	470.75
<u>Tuition and Fee Rates</u>						
	1					
AgBio Classes (Cat 2)			\$ 501	\$ 516	\$ 532	\$ 547
Other Classes (Cat 2)			\$ 501	\$ 516	\$ 532	\$ 547
Student fees			\$ 728	\$ 750	\$ 772	\$ 796
<u>Incremental Revenue Projections</u>						
			<u>2013/14</u>	<u>2014/15</u>	<u>2015/16</u>	<u>2016/17</u>
AgBio Classes			\$ 15,030	\$ 44,740	\$ 74,210	\$ 108,073
Other Colleges			\$ 60,120	\$ 97,684	\$ 128,743	\$ 149,640
Student fees			\$ 10,920	\$ 20,696	\$ 29,491	\$ 37,448
Total Incremental Revenue		-	\$ 86,070	\$ 163,120	\$ 232,443	\$ 295,161
<u>Cost Projections</u>						
Course delivery (AgBio)	2			\$ 4,160	\$ 4,326	\$ 4,499
Laboratory/tutorials	3		\$ 1,625	\$ 1,674	\$ 1,724	\$ 1,776
Markers, Teaching Assts	4		\$ 1,375	\$ 2,000	\$ 5,305	\$ 5,464
Supplies and excursions	5		\$ 1,200	\$ 1,500	\$ 2,000	\$ 2,000
Recruitment and promotion	6	\$ 6,000	\$ 2,000	\$ 1,500	\$ 1,500	\$ 1,500
College Administration	7		\$ 1,500	\$ 2,760	\$ 3,818	\$ 4,707
Student fee allocations	8		\$ 10,920	\$ 20,696	\$ 29,491	\$ 37,448
University Overhead	9		\$ 1,155	\$ 2,039	\$ 2,801	\$ 2,992
Total Incremental Costs		\$ 6,000	\$ 19,775	\$ 36,328	\$ 50,965	\$ 60,386
<u>Net Incremental Revenue/(Cost)</u>						
	10	\$(6,000)	\$ 66,295	\$ 126,791	\$ 181,478	\$ 234,774

Appendix 9: Budget Summary -continued

Notes

- 1 Tuition is estimated using category 2 rates as an average over all courses.
- 2 The two new ANBI courses are offered by current faculty as part of the normal teaching assignment. A sessional lecturer is required for ANBI 320 (restricted elective) and is cost-shared with the BSA program. Instruction of other AgBio courses is covered by existing faculty. Instruction in other college courses is provided by each college as outlined in the proposal.
- 3 There is a laboratory with ANBI 110 and a provision of 5 hours per week for teaching assistants is included.
- 4 Markers/teaching assistants support is included to assist with increased enrolments in AgBio courses and some VBMS sections. Assignment to courses will be developed when enrolment figures are known.
- 5 Laboratory supplies are required for ANBI 110. Some courses may feature excursions or off campus tours. If excursion costs are significant, fees will be applied for.
- 6 As the program is proposed for Fall 2013, recruitment material will be developed in 2012/13 and promotion will begin during the year.
- 7 A provision is included to recognize the additional support costs associated with additional students. These amounts are estimates only and would not necessarily be incurred each year.
- 8 Student fees are collected and re-allocated for USSU fees, health plans, etc, and do not result in a large influx to the University operations.
- 9 University overhead is included to recognize potential institutional support costs associated with additional students. Overhead is estimated at 15%, excluding student fees.
- 10 Under the current tuition revenue sharing 85% of incremental tuition will flow to the college providing instruction to cover costs. Following implementation of TABBS, it is assumed that a similar effect will occur, though revenue could include provincial operating grant and expenses will include additional indirect costs.

Appendix 10: B.Sc. (An. Biosc.) Budget: Process and Assumptions

Objective: to determine the incremental revenue and costs associated with offering the Bachelor of Science in Animal Bioscience.

There are four main aspects to this:

1. Estimate the program student population and source of students.
2. Determine if the existing courses have sufficient excess capacity to handle the new enrolments.
3. Identify the incremental tuition to the University of Saskatchewan and the College of Agriculture and Bioresources based on the student population and distribution of students to classes.
4. Identify the incremental costs to the University of Saskatchewan and College of Agriculture and Bioresources based on the nature of the course, student population, and capacity of classes offered.

1. Student Population

The first intake is expected to be in September 2013. There are three sources of new program enrolments – those that would have enrolled in the College of Agriculture and Bioresources, those that would have enrolled in other University of Saskatchewan programs, and those that would not have enrolled at the university without the Bachelor of Science in Animal Bioscience program.

Bachelor of Science in Agriculture

Some students attracted to B.Sc. (An. BioSc.) would have enrolled in the BSA Animal Science major. It is assumed that 25% (five) of the students would have enrolled in the College of Agriculture and Bioresources. These students are not incremental to the university and are considered in evaluation of course capacity, but not in incremental tuition or costs.

Students enrolled in other programs

The remaining 15 students are considered new to the university. The B.Sc. (An. BioSc.) is not expected to compete with other University of Saskatchewan programs. The program is intended to complement current offerings and provide an option for non-traditional students interested in animal bioscience. The program will also compete for students from Alberta and British Columbia.

2. Course Capacity

The impact of new program enrolments on the proposed class list was determined using the following assumptions:

Appendix 10: B.Sc. (An. Biosc.) Budget: Process and Assumptions- continuedDistribution:

- Students take all classes in the appropriate year.
- There are a sufficient number of Restricted and Open electives such that course capacity is not a limiting factor in those courses.
- Enrolment in restricted electives is evenly distributed among the options resulting in 50% of students in AgBio courses and 50% in other college courses.
- Enrolment in open electives results in 50% of students enrolling in AgBio courses and 50% in other college courses.

Capacity:

Capacity for each required course was determined based on current seats and enrolments for existing courses based on Sirius data for 2010/11.

By year 2, the projected enrolment in AgBio courses will exceed the current number of seats available in two courses. The number of seats will be increased to accommodate projected enrolment.

	Seats offered in 2010/11	Projected enrolment
ANSC 313	53	66
ANBI 470	20	24

Capacity restrictions were not placed on restricted or open electives as there is a wider selection of offerings and students will register in courses that are available.

3. Incremental Tuition

At the university level, only students new to the university can be counted for incremental tuition. Within the university, however, there may be shifts in enrolments and teaching activity attributed to each college. This shift was based on the following assumptions:

College of Agriculture and Bioresources

- Students that would have registered in the college without the B.Sc (An. BioSc.) have no impact on teaching activity associated with the College of Agriculture and Bioresources as they would normally enrol in an equivalent number of AgBio versus other college courses.
- All students new to the university would have an incremental impact

Appendix 10: B.Sc. (An. Biosc.) Budget: Process and Assumptions- continued

Other Colleges

- Students new to the university would have a positive impact as they enrol in required courses and electives offered by other colleges.

4. Incremental Costs

College of Agriculture and Bioresources

- A sessional lecturer for ANBI 320 is cost shared with the BSA
- Laboratory and teaching assistant expenses are provided for new courses or to assist those courses that will experience increased enrolment.

Other Colleges

- No impact is anticipated as students will enrol in existing offerings and additional tuition will be earned to offset any additional costs.

New courses

ANBI 110.3 Introductory animal bioscience

This class examines the domestication of agricultural and companion animals and their adaptation to human society. Comparative aspects of domestication, genetics, reproduction, neonatal development, endocrinology and environmental impacts will be reviewed.

Proposed instructors: Sheila Schmutz, Murray Drew, Natacha Hogan and Ryan Brook

ANBI 320.3 Equine Science

Prerequisite: 6 CU BIOL or permission of instructor

Presents the evolution of the horse's role in society, its current uses and the significance of the local and global equine industry. Management topics include housing, nutrition, hoof care and first aid to provide a foundation of information for the care of the horse. Reproduction and genetics lectures present reproductive endocrinology, the application of new technologies and basic equine genetics. Equine behaviour and learning is discussed in conjunction with management, training and equine welfare.

Replaces ANSC 250 and ANSC 350

Proposed instructor: Dianne Winkelman-Sim

ANBI 420.3 Comparative Animal Endocrinology

Prerequisite: VBMS 324/325 or BIOL 317

This course will examine the fundamentals of animal endocrine systems. Similarities and differences in endocrine function between different vertebrate groups will be discussed. Topics include anatomy and physiology of hormones and glands, mechanisms of hormone action, hormonal regulation of various physiological processes in animal systems, endocrine manipulation and monitoring, endocrine disruption and endocrine methodologies.

Proposed instructor: Natacha Hogan

ANBI 492.3 Literature Thesis in Animal Bioscience

Prerequisite: Successful completion of 75 credit units

The student develops a question to be explored in depth in an area relevant to domestic animal biology. Working with a faculty supervisor of his or her choosing, the student prepares a thesis on this topic through several stages of development and revision. Most often the thesis relies on current scientific literature but occasionally additional new data are analyzed. Each student delivers a presentation in a conference setting at the end of the course with other senior students and faculty in attendance.

Proposed instructor: All full-time faculty and adjunct instructors in Animal and Poultry Science are potential supervisors.

ANBI 494.6 Research Thesis in Animal Science

Prerequisite: Successful completion of 75 credit units.

This course is restricted to students with a 70 per cent cumulative average as of January of their third year. Students considering graduate work are encouraged to enroll. Placements are limited. The student develops a question to be explored in depth in an area relevant to domestic animal biology. Working with a faculty supervisor of his or her choosing, the student collects relevant data during a series of experiments conducted over the summer months. Two additional advisors participate in the student's committee. Statistical analysis of data are conducted and the student prepares a thesis based on their

results, through several stages of development and revision. Each student delivers a presentation in a conference setting at the end of the course with other senior students and faculty in attendance.

Proposed instructor: All full-time faculty and adjunct instructors in Animal and Poultry Science are potential supervisors, subject to financial circumstances of individual supervisors whose grant must cover the research expenses of the student.