

# Faculty of Agricultural, Life and Environmental Sciences

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# The Faculty of Agricultural, Life and Environmental Sciences

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## Providing Solutions for a Better World

Within the areas of environment, food and agriculture, human services and animal care, our programs equip learners with the scientific knowledge, economic understanding and social context to provide leading-edge solutions to some of the greatest challenges facing our world today. Hands-on learning experiences including field courses, practicum placements, work internships and international opportunities further help prepare students for the many exceptional career options available to graduates of our programs.

## Scholarships, Awards, and Bursaries

The Faculty of Agricultural, Life and Environmental Sciences offers one of the largest Faculty scholarship programs on campus, with awards available during all four years of an undergraduate program. This is in addition to other general scholarships offered by the University (available to all students) and scholarships outside the University from private businesses as well as government.

## Professional Accreditation

Our graduates are eligible for Professional Accreditation in one or more of a number of organizations depending on their field of study.

These include:

- Alberta Human Ecology and Home Economics Association (PHEc)
- Alberta Institute of Agrologists (PAg)
- College of Alberta Professional Foresters (RPF)
- College of Dietitians of Alberta (RD)
- Alberta Society of Professional Biologists (PBIol)

## Internship Program

The Faculty of Agricultural, Life and Environmental Sciences offers an Internship Program (IP) for students in all programs. Through the IP, students have an opportunity to take their studies beyond the classroom and participate in a four, eight, 12 or 16 month, full-time, competitively paid work placement.

## Graduate and Research Program

The Faculty has an active Graduate and Research Program. Our Faculty is the second most research-intensive Faculty at the U of A in terms of research funding per professor. Graduate students from around the world are enrolled in MA, MSc and PhD thesis programs, and non-thesis MA, MF and combined MA/MBA and MF/MBA programs. We are also actively involved in international research initiatives with many other countries in Asia, Africa, Europe and South America.

# The Professors

## Members of the Faculty

### Officers of the Faculty

**Dean**  
S Blade, PhD

### Vice-Dean

W Adamowicz, PhD

### Associate Dean (Academic)

S Jeffrey, PhD

### Associate Dean (Research and Graduate Studies)

MA Naeth, PhD

### Assistant Dean (Administration)

J Bell, PhD

### Assistant Dean (Academic and Student Programs)

J Bohun, MA

### Assistant Dean (Development)

M Perron, BCom

### Associate Director, Development

K Irwin, BCom

### Communications Director

C Wills, BJour

## Agricultural, Food and Nutritional Science

### Professor and Acting Chair

R Zijlstra, PhD

### Professors

J Aiken, PhD

B Ametaj, PhD

R Bell, PhD

M Belosevic (Cross Appointment with Biological Sciences)

E Bork, PhD (Mattheis Chair in Rangeland Ecology & Management)

D Bressler, PhD

C Chan, PhD (Joint Appointment with Physiology)

L Chen, PhD (Canada Research Chair in Plant Protein Structure Function and Nutraceutical Delivery)

J Curtis, PhD

W Dixon, PhD

M Dyck, PhD

C Field, PhD

M Gänzle, Dr rer nat (Canada Research Chair in Food Microbiology)

L Guan, PhD

L Hall, PhD

N Kav, PhD, Vice-Provost (Programs)

J Kennelly, PhD

DR Korver, PhD

L McMullen, PhD

M Oba, PhD

J Ozga, PhD

L Ozimek, PhD

G Plastow, PhD

S Proctor, PhD

H Rahman, PhD

F Robinson, PhD

D Spaner, PhD

S Strelkov, PhD

F Temelli, PhD

T Vasanthan, PhD

J Walter, PhD (CAIP Chair in Nutrition, Microbes and Gastrointestinal Health)

W Weselake, PhD (Canada Research Chair in Agricultural Biotechnology)

J Wu, PhD

R Yang, PhD (ARD Professor)

### Associate Professors

M Aranda Saldana, PhD

D Barreda, PhD (Joint Appointment with Biological Sciences)

M Betti, PhD

H Bruce, PhD

J Buteau, PhD

A Farmer, PhD

R Jacobs, PhD

C Li, PhD (AAFC Associate Professor & Chair, Bovine Gen)

D Mager, PhD (Joint Appointment with Pediatrics)

V Mazurak, PhD

P Stothard, PhD

D Vine, PhD

Z Wang, PhD

N Willows, PhD

W Wismer, PhD

M Zuidhof, PhD

### Assistant Professors

C Bench, PhD

C Carlyle, PhD

C Fitzsimmons, PhD (AAFC Assistant Professor)

C Prado, PhD (CAIP Chair in Nutrition, Food and Health)

M Steele, PhD

A Ullah, PhD

B Willing, PhD (Canada Research Chair in Microbiology of Nutrigenomics)

### Adjunct Professors

J Aalhus, PhD

G Ball, PhD

V Baracos, PhD

J Basarab, PhD

K Beauchemin, PhD

H Beckie, PhD

E Beltranena, PhD

V Carney

K Chang, PhD

N Cook, PhD

M Dyck, PhD

A Haqq, PhD

N Harker, PhD

M Hills, PhD

R Howard, PhD

S Hwang, PhD

D Inglis

T Jones

B Larsen, PhD

S Markus, PhD

J Matte, PhD

T McAllister, PhD

R Mosenthin, PhD

J O'Donovan, PhD

M Pakseresh

Z Pietrasik

K Raine, PhD

P Robson, PhD

A Schaefer, PhD

S Shah, PhD

S Sharma, PhD

S Strydom

M Swift, PhD

K Turkington, PhD

J Turner, PhD

C Willenborg, PhD

W Yang

X Yang

### Professors Emeriti

A Bailey, PhD

R Ball, PhD

T Basu, PhD

P Blenis, PhD

J Bowland, PhD

K Briggs, PhD

R Christopherson, PhD

M Clandinin, PhD

E Donald, PhD

J Feddes, PhD

G Foxcroft, PhD

M Gee

R Hardin, PhD

Z Hawrysh, PhD

C Hiruki, PhD

P Jelen, PhD

J King, PhD

J Leonard, PhD

L McCargar, PhD

M Makarechian, PhD

G Mathison, PhD

B Ooraikul, PhD

M Price, PhD

J Russell, PhD

W Sauer, PhD

J Sim, PhD

M Spencer, PhD

P Sporns, PhD

M Stiles, PhD

G Stringam, PhD

J Tewari, PhD

E Toop, PhD

V Vandenborn, PhD

P Walton, PhD

### Administrative Officer

F Paradis, PhD

### Faculty Service Officers

U Basu, PhD

H Bates, MSc

B Irving, PhD

R Uwiera, PhD

L Grenwich, DVM

## Human Ecology

### Professor and Acting Chair

D Williamson, PhD

### Professors

J Fast, PhD

N Keating, PhD

### Associate Professors

A Bissonette, PhD

R Breitreuz, PhD

A Oak, PhD

D Williamson, PhD

### Assistant Professors

A Galovan, PhD

P Dashora, PhD

M Johnson, PhD

R McQueen, PhD

J Min, PhD

M Strickfaden, PhD

### Adjunct Professors

P Devlieger, PhD

R Gokiart, PhD

M Mayan, PhD

J Petrov, PhD

D Torvi, PhD

K Van Assche, PhD

S Wen, PhD

R Wickman, PhD

### Professors Emeriti

W Adams

L Capjack, MSc

E Crown, PhD

T Dennis, MSc

N Gibson, PhD

A Kernalguen, PhD

N Kerr, PhD

D Kieren, PhD

M Lambert, PhD

B Munro, PhD

R Renner

E Richards, PhD

### Administrative Officer

L Moran, MSc

### Faculty Service Officers

J Batcheller, PhD

V Blinova, PhD

K Chandler, MSc

## Renewable Resources

### Professor and Chair

E Macdonald, PhD

### Professors

S Chang, PhD

P Comeau, PhD

D Davidson, PhD (Joint appointment with Resource Economics and Environmental Sociology)

M Flannigan, PhD

L Foote, PhD

R Grant, PhD

U Hacke, PhD (Canada Research Chair in Tree-Water Relations)

F He, PhD (Canada Research Chair in Biodiversity & Landscape Modeling)

S Landhäusser PhD (NSERC Industrial Research Chair in Forest Land Reclamation)

V Lieffers, PhD

M Micko, PhD

S Quideau, PhD

M Naeth, PhD

F Schmiegelow, PhD

B Shoty, PhD (Bocock Chair in Agriculture and Environment)

U Silins, PhD

J Spence, PhD

J Zwiazek, PhD

### Associate Professors

M Dyck, PhD

G Armstrong, PhD

D Davidson, PhD (Joint Appointment with Resource Economics and Environmental Sociology)

N Erbilgin, PhD (Canada Research Chair in Forest Entomology)

A Hamann, PhD

S Nielsen, PhD

T Siddique, PhD

B Thomas, PhD (NSERC Industrial Research Chair in Tree Improvement)

### Assistant Professors

M Bokalo, PhD

G Hernandez Ramirez, PhD

M Mackenzie, PhD

D Olefeldt (Campus Alberta Innovates Program Chair in Watershed Management and Wetland Restoration)

M Poesch, PhD

J Karst, PhD

### Adjunct Professors

A Anderson, PhD

A Anyia, PhD

M Arshad, PhD

J Bhatti, PhD

R Caners, PhD

L Carbyn, PhD

P Cott, PhD

M Edwards, PhD

E Enders, PhD

T Faechner, PhD

K Franke, PhD

J Gould, PhD

R Hall, PhD

E Hogg, PhD

S Huang, PhD

D Langor, PhD

D Locky, PhD

S Malhi, PhD

G McKenna, PhD

M Parisien, PhD

V Peters, PhD

B Pinno, PhD

S Pruss, PhD

M Swallow

M Taylor, PhD

D Thompson, PhD

M Wheatley, PhD

B White, PhD

### Professors Emeriti

A Bailey, PhD

J Beck, PhD

P Blenis, PhD

J Butler, PhD

D Chanasyk, PhD

F Cook, PhD

P Crown, PhD

B Dancik, PhD

K Domier, PhD

M Dudas, PhD

A Hellum, PhD

N Juma, PhD

G Kachanoski, PhD

## General Information

### General Information

The Faculty of Agricultural, Life and Environmental Sciences administers undergraduate programs that lead to the following degrees.

#### **BSc in Agricultural/Food Business Management**

##### **Majors:**

Agricultural Business Management  
Food Business Management

#### **BSc in Agriculture**

##### **Majors:**

Agricultural and Resource Economics  
Animal Science  
Crop Science  
Range and Pasture Management (Effective Fall 2012, applications to this major are no longer accepted. Interested students should consider applying to the BSc Environmental and Conservation Sciences, Wildlife and Rangeland Resources Management major.)  
Sustainable Agricultural Systems

#### **BSc in Animal Health**

##### **Majors:**

Companion and Performance Animals  
Food Animals  
Food Safety and Quality

#### **BA in Environmental Studies**

#### **BSc in Environmental and Conservation Sciences**

##### **Majors:**

Conservation Biology  
Environmental Economics and Policy  
Human Dimensions of Environmental Management  
Land Reclamation  
Wildlife and Rangeland Resources Management  
Northern Systems (delivered in Whitehorse, YT in partnership with Yukon College)

#### **BSc in Environmental and Conservation Sciences - Bilingual**

##### **Majors:**

Conservation Biology  
Environmental Economics and Policy  
Human Dimensions of Environmental Management  
Land Reclamation  
Wildlife and Rangeland Resources Management

#### **BSc in Environmental and Conservation Sciences/BA in Native Studies Combined Degrees**

#### **Major in Human Dimensions of Environmental Management**

#### **BSc in Forest Business Management**

#### **BSc in Forestry**

#### **BSc in Human Ecology**

##### **Majors:**

Family Ecology  
Clothing, Textiles and Material Culture

#### **BSc in Human Ecology/BEd Combined Degrees**

#### **BSc in Nutrition and Food Science**

General Program  
Dietetics Specialization  
Food Science and Technology Specialization

#### **BSc Honors in Food Science**

#### **BSc Honors in Nutrition**

#### **Preprofessional Program**

#### **Pre-Veterinary Medicine**

For further information, visit Student Services at 2-06 Agriculture-Forestry Centre, or call us at (780) 492-4933 or 1-800-804-6417 (Western Canada), or e-mail questions@ales.ualberta.ca. Our homepage is at www.ales.ualberta.ca.

## Faculty Objectives

Our undergraduate mission is to promote the development of graduates who are scientifically competent; sensitive to environmental, global, and other social issues; creative; and capable of leadership in addressing challenges faced by individuals, families, and the agriculture, forestry, food, and other natural resources sectors. The Faculty strives to develop the following skills and traits in its students:

1. Critical and creative thinking skills: the ability to analyze, integrate, and extrapolate information;
2. Good judgment in problem solving and decision making;
3. Good communication skills: literacy, speaking, and listening;
4. An appreciation of knowledge and education, and a commitment to continuous learning; and
5. An appreciation and understanding of international and cross-cultural considerations.

The Baccalaureate degrees in the Faculty provide students with a broad education and comprehensive preparation in their specialities. Programs provide students with

1. a solid foundation in applicable social, physical, and biological sciences, and in the humanities. Programs stress more than simple proficiency in these disciplines; they offer courses that feature an integrated, multidisciplinary treatment of subjects;
2. awareness of current issues in the various disciplines and the ability to solve problems in their chosen occupations.
3. the necessary academic background for graduate studies.

## Certificates

Students in the Faculty of Agricultural, Life and Environmental Sciences (ALES) have the option of pursuing embedded certificates which recognize the fact that they have studied a specific theme. Such themes may be subjects within a particular discipline or across disciplines. Normally, requirements for an embedded certificate can be completed as part of the requirements in their degree program; however, there may be instances where courses additional to the minimum requirements for his/her degree program may be required in order to qualify for both the degree and the certificate. Currently, the following certificates are available to ALES students.

## Faculty Regulations

### Admission and Transfer

General University admission requirements are detailed in Admission to Undergraduate Programs and General Admission Requirements. Detailed admission requirements for the Faculty of Agricultural, Life and Environmental Sciences are specified in Faculty of Agricultural, Life and Environmental Sciences.

The Faculty of Agricultural, Life and Environmental Sciences functions under enrolment management. As such, the Faculty's total student enrolment is limited. All applications with the minimum Admission Grade Point Average (AGPA) are evaluated and ranked as part of an applicant pool. Spaces in programs are allocated to the top applications in the applicant pool downward until the spaces in the programs are filled. Therefore, in any given year, the AGPA cutoff to a degree program may be higher than the minimum AGPA required for consideration.

Applicants should indicate their choice of a degree program and major on their application. Those who have not selected a major by the end of their first year in the program shall be required to declare one before registering for the next academic year.

1. **Residence Requirement:** A maximum of two years of transfer credit completed outside the University of Alberta will be granted toward an undergraduate degree in the Faculty of Agricultural, Life and Environmental Sciences. This consists of ★60 or its equivalent. A minimum of ★60 must be completed at the University of Alberta, of which a minimum of ★30 must be completed while registered in this Faculty. Students are advised to discuss their course and program requirements with Student Services (2-06 Agriculture-Forestry Centre).

2. **Permission to take courses at another postsecondary institution:** Following initial admission, students are expected to complete all requirements at the University of Alberta. Students may apply for permission to take courses at another institution for credit to their degree program iff
  - a. they are degree students in the Faculty of Agricultural, Life and Environmental Sciences; and
  - b. they present Satisfactory academic standing (i.e., Fall/Winter Grade Point Average of 2.0 or greater).  
Approval is not granted when the student has already received the maximum allowable transfer credit. There is no obligation to grant transfer credit unless prior permission has been obtained. Qualified students must contact Student Services (2-06 Agriculture-Forestry Centre) to obtain the necessary forms and approval before enrolling at another institution.
3. **Exchange Programs:** For students already admitted to a program in the Faculty of Agricultural, Life and Environmental Sciences who are participating in approved international exchange programs, credit is considered on a course-by-course basis. The residence requirement defined in (1) above applies to students participating in such exchanges.

## University Infectious Diseases Regulation

See University Infectious Diseases Regulation.

## Practicum Placements, Professional Practice and the Public Interest

The Dean, or a designate acting on behalf of the Dean, may immediately deny assignments of a student, withdraw a student from, or vary terms, conditions or site of a work experience placement or practicum (Internship, Cooperative Education, Integrated Dietetics and the Human Ecology Practicum), if the Dean or designate has reasonable grounds to believe that this is necessary in order to protect the Public Interest. Refer to Practicum Intervention Policy.

## Academic Standing

1. **Assessment of Academic Standing**  
Academic standing will be assessed on the basis of a grade point average (GPA). Students are expected to maintain a GPA of at least 2.0. See Additional Grades and Remarks and Academic History (Transcript) Records for information on calculation of GPAs and the academic record. The assignment and reassignment of academic standing are based on a student's performance in a minimum of ★9. If, at the time of review, the student has attempted fewer than ★9 since the last assignment of academic standing, the review will be deferred and the academic standing assigned at the last review will remain in effect until the next review.
2. **Continuation in the BSc Honors in Food Science and the BSc Honors in Nutrition**  
Continuation in the BSc Honors in Food Science and the BSc Honors in Nutrition requires a GPA of at least 3.0  
Students in the BSc Honors in Food Science who do not attain the required GPA will be moved to either the BSc in Nutrition and Food Science, Food Science and Technology Specialization or the BSc in Nutrition and Food Science, General Program. Students in the BSc Honors in Nutrition who do not attain the required GPA will be moved to the BSc Nutrition and Food Science, General Program (provided they are not Required to Withdraw). The Academic Standing section (4) below will then be applied. Students in good academic standing who wish to transfer to the Nutrition and Food Science General Program (see BSc in Agriculture, BSc in Animal Health, BSc in Environmental and Conservation Sciences, BSc in Forestry, and BSc in Nutrition and Food Science (General Program) and BSc Nutrition and Food Science, Nutrition Major), the Dietetics Specialization (see BSc in Nutrition and Food Science, Dietetics Specialization and BSc Honors in Nutrition), or the Food Science and Technology Specialization (see BSc in Nutrition and Food Science, Food Science and Technology Specialization and BSc Nutrition and Food Science, General Program [ALES]) must apply for admission..
3. **Continuation in the BSc Nutrition and Food Science Dietetics Specialization and the BSc Nutrition and Food Science, Food Science and Technology Specialization )**

Continuation in the BSc Nutrition and Food Science, Dietetics Specialization and the BSc Nutrition and Food Science, Food Science and Technology Specialization requires a GPA of at least 2.7. Students who do not attain the required GPA will be moved to the BSc in Nutrition and Food Science, General Program. The Academic Standing section (4) below will then be applied. Whenever a student receives a grade of NC in a professional practice course, the student's total academic and clinical performance is reviewed and considered in order to determine whether the student should be allowed to continue in the program..

### 4 Application of Academic Standing

- a. **Satisfactory Standing** (GPA 2.0 or higher) Students who maintain a satisfactory standing are permitted to continue their studies in the Faculty subject to meeting the specific requirements of their degree and the general requirements of the University of Alberta.
- b. **Marginal Standing** (GPA 1.7 to 1.9, inclusive). Students receiving their first marginal standing are permitted to continue their studies in the Faculty under academic warning. At the next assignment of academic standing, such students must present a Fall/Winter GPA of at least 2.0 on a minimum of ★9 to clear academic warning and continue their studies with Satisfactory Standing.  
Students with Marginal Standing twice during their Academic Career in the Faculty will be required to withdraw (see d. Required to Withdraw)..
- c. **Unsatisfactory Standing** (GPA of 1.6 or lower). Students with unsatisfactory standing are required to withdraw (see d. Required to Withdraw).  
Students who are required to withdraw from the Faculty at the end of Fall/Winter may not register for the following Summer or Fall/Winter Terms. Students who register for Summer or Fall/Winter courses prior to the requirement to withdraw will have their registration cancelled without penalty.
- d. **Requirement to Withdraw**  
Students with Unsatisfactory Standing or who are placed on Marginal Standing twice during their Academic career in the Faculty will normally be required to remain out of the Faculty (required to withdraw).

- i. Students who have completed less than ★60 and who have achieved a GPA of between 1.3 and 1.6 may be permitted to continue at the University of Alberta in the Fresh Start program providing they have not previously been required to withdraw from any postsecondary program. Normally, students who have committed an academic offense under the University of Alberta Code of Student Behavior will not be recommended for the Fresh Start Program.

The Faculty will determine whether to recommend a student for participation in the Fresh Start program and will notify the student of that option. Successful completion of ★18 with a GPA of at least 2.7 or ★24 with a GPA of at least 2.0 [2.3 for the Business Management programs and 3.0 for the BSc in Nutrition and Food Science (Nutrition Major)] will be required for readmission. Further detailed information can be found in First- and Second-Year Students with GPAs of 1.3 to 1.6—Admission to Fresh Start Program, GPA Withdrawal Review, and Fresh Start Program.

If successful in the Fresh Start program and all conditions specified by Open Studies and the Faculty have been fulfilled, students may apply for readmission to the Faculty as transfer students as described in Transfer Applicants.

- ii. Students may discontinue studies for one year with permission of the Faculty and apply for readmission. Students who are readmitted will return on academic probation as described in Academic Warning, Academic Probation, Required to Withdraw subject to the terms specified by the Faculty at the time of the requirement to withdraw.
- iii. Students who complete ★18 transferable to the University of Alberta with an AGPA of 2.7 or ★24 transferable to the University of Alberta with an AGPA of 2.0 [2.3 for the Business Management programs and 3.0 for the BSc in Nutrition and Food Science (Nutrition Major)] at another postsecondary institution may reapply for admission to the Faculty, unless they have been required to withdraw more than once from any postsecondary programs [see Withdrawal From Postsecondary Institution and GPA Withdrawal Review.]

iv. Students may petition their Required to Withdraw status and if successful will proceed on Academic Probation. At the next assignment of academic standing, such students must raise their Fall/Winter GPA to at least 2.0. Should their Fall/Winter GPA fall below 2.0 at any time during the rest of their program they will be required to withdraw and will not be readmitted to the Faculty.

v. Students who have been required to withdraw and who, after being readmitted, again fall below a Fall/Winter GPA of 2.0 will be required to withdraw and will not be readmitted to the Faculty.

Note: Students with marginal standing or who are on academic probation are only permitted to interrupt their programs with the prior, written approval of the Associate Dean (Academic). Should students in either of these categories interrupt their programs for more than twelve months without prior approval, readmission will not be granted unless the student meets the current readmission criteria.

**5. First-Class Standing:** First-Class Standing in a given year is awarded to any undergraduate student who obtains a GPA of not less than 3.5 on a minimum of ★24 taken during Fall/Winter. Students who attend for only one term of Fall/Winter are eligible if they complete at least ★12 with a minimum GPA of 3.5.

**6. Dean's List:** This designation is given to students who achieve a GPA of at least 3.7 on a minimum of ★18 in Fall/Winter. Students who attend for only one term of Fall/Winter are eligible if they complete at least ★9 with a minimum GPA of 3.7.

## Graduation

### 1. Application for Graduation:

Students must apply for graduation on Bear Tracks (<https://www.beartracks.ualberta.ca>) by February 1 for Spring Convocation or by September 1 for Fall Convocation.

### 2. Convocation:

Students completing degree requirements during the Fall Term or Winter Term will graduate at Spring Convocation; those completing degree requirements during the Spring/Summer will graduate at Fall Convocation.

### 3. Degree Requirements:

Students registered in the following degree programs require ★120 to graduate: BSc Agriculture, BSc Agricultural/Food Business Management, BSc Animal Health, BSc Environmental and Conservation Sciences, BA Environmental Studies, BSc Forestry, BSc Forest Business Management, BSc Human Ecology, and BSc Nutrition and Food Science. Students registered in the BSc in Human Ecology/BEd and the BSc in Environmental and Conservation Sciences/BA in Native Studies Combined Degrees require ★150 to graduate..

### 4. Courses Extra to the Degree

Courses successfully completed while registered in a program which are not being used for degree credit are known as courses extra to the degree. Such courses are, however, included in the assessment of academic standing. Students who register for more than a minimum number of courses for graduation should designate the additional courses as extra. In order to exclude courses in excess of the minimum requirement from the contract for graduation, students must designate such courses as "extras" at the time of registration for their final year..

### 5. Graduation Grade Point Average

To be eligible for graduation from any of the programs offered by the Faculty of Agricultural, Life and Environmental Sciences, students must present Satisfactory Academic Standing [see (6) below] and obtain a GPA of at least 2.0 (2.7 for the BSc in Nutrition and Food Science, Food Science and Technology Specialization and the BSc in Nutrition and Food Science, Dietetics Specialization; and 3.0 for the BSc in Honors in Food Science and the BSc Honors in Nutrition) on their last ★60 normally completed during the third and fourth years.

Where more than ★60 were completed in the last two years, the grades from all courses completed in the last year will be used in this calculation. Additional credits from the previous term(s) (whether completed at this university or at another institution) will be used as necessary to make the ★60 requirement.

Where fewer than ★60 were completed in the last two years, the grades from all courses completed in the last two years will be used in this calculation. Additional credits from the previous term(s) (whether completed at this university or at another institution) will be used as necessary to make

the ★60 requirement. The grade points for additional courses needed to make ★60 will be calculated by multiplying the GPA of all courses completed in that term by the number of credits required to make ★60.

Where students have designated successfully completed courses extra to the degree, the designated courses will not be included in the calculation of the graduation GPA..

### 6. Extension to the Graduating Year

Students who have successfully completed at least ★120 or ★150 [for programs as indicated in (3)] who do not meet program requirements for graduation, and who are otherwise eligible to continue in their program of study, may continue to register to the end of the next Fall/Winter of study in order to meet graduation requirements.

Students who have been given their first assignment of "Marginal Standing" (i.e. Academic Warning) in their graduating year, may continue to register to the end of the next Fall/Winter of study. Students must complete a minimum ★9 to a maximum ★15 to meet the "Satisfactory Standing" requirement for graduation [see (8) above].

Students who are in Unsatisfactory Standing, (i.e., Required to Withdraw), may petition/appeal to be allowed to complete one further Fall/Winter of study to meet the "Satisfactory Standing" for graduation requirements. If graduation requirements are not met within the Fall/Winter period, such students will be required to withdraw and will not normally be readmitted..

### 7. Graduation with Distinction

This designation is awarded to a student achieving a grade point average of 3.5 or greater on the last ★60. The same calculation as detailed in Graduation Grade Point Average in (5) above applies.

## Courses

### 1. Selection of Courses

Students are responsible for familiarizing themselves with program requirements and limitations as specified in the Calendar, for ensuring their programs are properly planned in accordance with degree specifications, and for the completeness and accuracy of their registration. Please read the Calendar carefully before registering in courses, and if you are in doubt about any regulations pertaining to your program, consult the Student Services (2-06 Agriculture-Forestry Centre) for clarification.

Students wishing to take more than ★15 in a term must have satisfactory standing and approval of Student Services (2-06 Agriculture-Forestry Centre).

### 2. Selection of First-Year Courses

Beginning first-year students who have completed no credits toward their programs normally restrict their registration to junior courses. First year students contemplating taking senior level courses should be careful to ensure that they have completed any prerequisites.

### 3. Withdrawal from Courses

Courses from which the student withdraws up to and including the last day for registration in the Fall and Winter Terms will not appear on the student's record. Courses from which the student withdraws after the last day of registration and up to and including the last day for dropping courses will appear with a grade of "W" (Withdrawn with permission) on the transcript.

Deadlines for withdrawing from courses are listed in Academic Schedule.

## Interruption of Studies

Students who wish to take a break from studies for more than 12 months will be required to reapply in order to continue with their studies. Students will follow the new program requirements when they return to the Faculty. Permission to follow their current requirements can be requested by writing the Associate Dean (Academic) at least 14 days prior to the beginning of the term that the student wishes to miss.

Students with marginal standing or who are on academic probation are only permitted to interrupt their studies with the prior, written approval of the Associate Dean (Academic). Should students in either of these categories interrupt their programs for more than twelve months without prior approval, readmission will not be granted unless the student meets the current readmission criteria.

## Time Limit to Complete Program

Students in the BSc Nutrition and Food Science, Dietetics Specialization must complete their program within six years from the year of original admission to the Dietetics Specialization. Exception requests must be submitted to the Associate Dean (Academic).

For all other programs offered by the Faculty, students who have not completed their degree within eight years from the year of original admission and wish to do so must follow the program requirements in the current Calendar. Exception requests must be submitted to the Associate Dean (Academic).

## Petitions and Appeals

The Faculty of Agricultural, Life and Environmental Sciences has petition and appeal procedures so that students who encounter special problems relating to academic standing, grade or course concerns, and program requirements have them reviewed in an equitable manner. A copy of these Faculty regulations regarding petitions and appeals may be obtained from Undergraduate Student Services, 206 Agriculture-Forestry Centre.

Note: Deadlines exist for submission of petitions and appeals. Contact the Faculty for details.

Under certain conditions, an unsuccessful appeal within the Faculty may be carried to the General Faculties Council Academic Appeals Committee. See Appeals and Grievances

## Student Advisory Services

Undergraduate students seeking advice on academic matters, are encountering special difficulties related to their programs or to Faculty decisions, and students with problems of an individual nature should consult Undergraduate Student Services, 206 Agriculture-Forestry Centre.

## Programs of Study

### Degrees Offered

The Faculty offers programs leading to ten BSc degrees with a common structure and one BA (see General Information for a complete program listing). Curricular elements are drawn from the natural and social sciences and consist primarily of courses offered by the Faculty. Foundation courses, which provide basic background principles, are also offered by the Faculty of Arts, Faculty of Business and Faculty of Science.

- Program Core:** The Program Core consists of the central program elements in each degree.
- Requirements of the Major:** The major focuses specialization within each degree program. Most programs offer majors, and a chosen major must be declared (see Note)
- Requirements of Minors:** Minors provide structured customization of the degree. Not all programs and majors include minors. Whether minors are optional or required, students who will complete a minor must declare it (see Note).
- Approved Program Electives (APEs):** APEs build on the requirements of the major and allow some customization of the learning experience. These groupings further develop depth of knowledge in key aspects of the major. Most APEs are taken at the senior level; normally only ★6 APEs are allowed at the 100- and 200-level. APEs should be selected from lists developed annually by the Faculty (see Note).
- Free Electives:** Free Electives allow students to broaden their background and knowledge base. These courses may build on their discipline or be of personal interest but unrelated to their program.
- Capstone Courses:** Capstone Courses synthesize knowledge and skills learned throughout the four years of the program. These courses are integrative and experiential, and are taken in the final year. The Faculty reviews potential Capstone Courses annually to ensure that specific criteria are met.

- Course Sequencing:** Students should complete all junior requirements before taking senior courses. 100-level courses from Program Cores should be taken in first year. Prerequisites must be followed and considered when planning course sequencing. Prerequisites and corequisites for each course are found in the Courses Listings section of the Calendar.

**Note:** Forms to declare majors and minors, and lists of APE courses are posted at [www.ales.ualberta.ca](http://www.ales.ualberta.ca)

## Internship and Cooperative Education Programs

Students in the Faculty of Agricultural, Life and Environmental Sciences have the opportunity to complete a paid work experience component as part of their program. Two options, detailed in Internship Program and Cooperative Education Program are available.

### Internship Program

The Internship Program (IP) is coordinated by the Career Centre under the supervision of the Faculty of ALES and is open to students registered in one of the Faculty programs.

The IP provides experiential learning to augment academic study with a four-, eight-, 12- or 16-month period of paid, discipline-related work experience with a cooperating employer. Students need to have completed 36 credits, including a minimum of 12 ALES credits. Upon completing the work experience period students return for at least one academic term. To accommodate the work experience period, students normally require between four and five years to complete the full degree requirements.

Students can apply for acceptance into the IP in their second year of study if they are in good academic standing, are legally permitted to work in Canada, and are registered in one of the academic programs offered by the Faculty of Agricultural, Life and Environmental Sciences. International students must have a working visa when applying to the program. Application forms, admission process and requirements are available on the Career Centre website. Applicants must meet a spoken English requirement (see Spoken English Requirement).

Students are encouraged to apply to the program as early as possible. Students registered in the IP receive assistance in finding suitable work placements. Students can approach employers to hire them as interns as well as compete on posted internship placements. Students can start internship terms in January, May or September. The ultimate responsibility for securing work rests with the student and there is no guarantee that all qualified students will be placed.

While engaged in work experience, IP students are enrolled in WKEXP courses, and are considered full-time students at the University of Alberta. To successfully complete the IP, students must complete a minimum of four months of the following WKEXP courses: WKEXP 981, WKEXP 982, WKEXP 983. All WKEXP courses are ★0 and are graded on a credit/no credit basis. Grades are determined by the student's job performance, as evaluated by the employer, and by the student's final report, as evaluated by the Career Centre and the Faculty of Agricultural, Life and Environmental Sciences.

Further information about the IP can be obtained by contacting the Employer Relations Advisor at the Career Centre.

Students should be aware that under Alberta's Protection for Persons in Care Act, they may be required to satisfy a criminal records check before being allowed to serve a period of internship work. See Requirement for Police Information Checks for further details..

### Cooperative Education Program

- General Information:** The Cooperative Education Program is coordinated by the Faculty of Business and is open to students registered in Agricultural/Food Business Management or Forest Business Management programs. Details are described in BCom (Cooperative Education Program).

All students who are Canadian citizens or permanent residents are eligible to compete for places in the co-op program following successful completion of the second year of studies in Agricultural/Food Business Management or Forest Business Management. Students are admitted to the program based on a combination of grades, letter of intent, letters of reference, and a personal interview. The application deadline is June 30.

- Course Sequence:** The required courses for Cooperative Education students are the same as provided in the BSc Agricultural/Food Business Management Program or BSc Forest Business Management Program. In

addition, Year 3 includes Introduction to Cooperative Education (non-credit seminar) and WKEXP 911. Year 4 (and 5) include WKEXP 912 and WKEXP 913. Note that the final term in the Cooperative Education Program must be a school term.

## Preprofessional Programs

Students admitted to a Faculty of Agricultural, Life and Environmental Sciences program who plan to apply to a professional program should consult the relevant Calendar sections to ensure that they are satisfying preprofessional requirements and program requirements.

### Pre-Veterinary Medicine

- 1. General Information:** Pre-Veterinary Medicine at the University of Alberta is intended to allow the student to meet the entry requirements of either the University of Calgary Faculty of Veterinary Medicine or the Western College of Veterinary Medicine, University of Saskatchewan while working towards a degree offered by the Faculty. Only Alberta residents are eligible to apply to the University of Calgary Faculty of Veterinary Medicine, while the Western College of Veterinary Medicine typically admits only students from western Canada with quotas for each province. Students with the highest academic standing during their pre-veterinary years will generally receive preference. Application may be made to veterinary programs once necessary requirements are met, after two or more years of study. For detailed information on residence policy and admissions procedures, contact the Admissions Office of the veterinary schools.

Applicants should be aware of the total time required to obtain a veterinary degree and license to practice in Alberta - a minimum of two years of pre-veterinary studies (normally three to four years pre-veterinary), then four years of veterinary studies at an accredited institution, at which point the DVM degree is awarded.

Students planning to enter Pre-Veterinary Medicine should note the entrance requirements in Pre-Veterinary Medicine. Inquiries about Pre-Veterinary Medicine should be addressed to Student Services (2-06 Agriculture-Forestry Centre), Faculty of Agricultural, Life and Environmental Sciences, University of Alberta. E-mail questions@ales.ualberta.ca..

- 2. Courses:** A minimum of two full years of university training are required for admission to the Western College of Veterinary Medicine or to the University of Calgary Faculty of Veterinary Medicine.

Pre-veterinary courses can be taken in either the BSc Agriculture Program (Animal Science major) or the BSc Animal Health Program (any major). All courses required for application to veterinary programs can be completed over two to four years while meeting the requirements of either of these programs. A course selection guide sheet showing the courses normally required for application to the western Canadian veterinary programs will be issued to students selecting Pre-Veterinary Medicine. Knowledgeable Faculty Advisors are available to provide further information to Pre-Veterinary Medicine students in Faculty of Agricultural, Life and Environmental Sciences programs.

- 3. Completion of Programs in the Faculty of Agricultural, Life and Environmental Sciences:** Students will complete the requirements of Pre-Veterinary Medicine while registered in the Faculty and working towards one of the degrees the Faculty offers. Undergraduate students seeking advice on academic matters should refer to Student Advisory Services.

### Other Preprofessional Programs

Those wishing to apply to professional programs, such as Business, Dietetics, Education, Law, Medicine, Pharmacy or others, must normally complete one or more preprofessional years before applying for admission to the program. The required courses or their equivalents may be taken by students who are registered in various programs in the Faculty of Agricultural, Life and Environmental Sciences, with careful selection of free electives and approved program electives.

## BSc After an Undergraduate Degree not from the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta

An applicant holding an undergraduate degree may qualify for an ALES BSc Degree by meeting the following requirements:

1. An applicant who holds an undergraduate degree (either from the University of Alberta or another university) and who wishes to pursue a degree in the Faculty of Agricultural, Life and Environmental Sciences must satisfy all admission requirements (see Faculty of Agricultural, Life and Environmental Sciences), as well as program, academic standing and graduation requirements of the particular degree program (see Academic Standing and Programs of Study). The total number of units of course weight required to satisfy the program requirements will vary depending on the degree held and the degree sought; however, a minimum of ★54 will always be required. In some cases, more than ★54 will be required depending on the applicability of courses completed as part of the first degree. The specific course requirements are determined by transfer credit assessment at the time of admission.
2. Any deficiency in a matriculation requirement or a high school prerequisite to a program requirement must be cleared before admission to the degree program.
3. A minimum of ★54 must be completed while registered at the University of Alberta, ★30 of which must be completed while registered in the Faculty of Agricultural, Life and Environmental Sciences.
4. The degree program selected may be the same as the first degree program if another major is selected.
5. Combined degree programs are not available to students who already have one of the two degrees.

## BSc After an Undergraduate Degree from the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta

### General Information

An applicant holding an undergraduate degree may qualify for an ALES BSc Degree by meeting the following requirements:

1. An applicant who holds a degree from the Faculty of Agricultural, Life and Environmental Sciences and who wishes to pursue another degree in the Faculty must satisfy all admission requirements (see Faculty of Agricultural, Life and Environmental Sciences), as well as program, academic standing and graduation requirements of the particular degree program (see Academic Standing and Programs of Study). The total number of units of course weight required to satisfy the program requirements will vary depending on the degree held and the degree sought; however, a minimum of ★30 will always be required. In some cases, more than ★30 will be required depending on the applicability of courses completed as part of the first degree. The specific course requirements are determined by transfer credit assessment at the time of admission.
2. Any deficiency in a matriculation requirement or a high school prerequisite to a program requirement must be cleared before admission to the degree program.
3. A minimum of ★30 must be completed while registered in the Faculty of Agricultural, Life and Environmental Sciences.
4. The degree program selected may be the same as the first degree program if another major is selected.
5. Combined degree programs are not available to students who already have one of the two degrees..

## Graduate Studies

Programs leading to advanced degrees at the Master's and Doctorate levels are offered by most Faculty departments. Course programs and thesis projects are arranged in consultation with Faculty members or with the Department's graduate coordinator.



See this Calendar's Graduate Programs General Information for general information about graduate studies. Specific information about requirements and opportunities in a particular field of study may be obtained from the appropriate Department in the Faculty of Agricultural, Life and Environmental Sciences. These Departments include:

Agricultural, Food and Nutritional Science  
Human Ecology  
Renewable Resources  
Resource Economics and Environmental Sociology

## Northern ENCS Program

The Faculty of Agricultural, Life and Environmental Sciences offers, in partnership with Yukon College, a Bachelor of Science degree in Environmental and Conservation Sciences (BSc ENCS), delivered in the Yukon.

Students learn skills to develop solutions to issues such as global climate change, decreasing nonrenewable energy resources, land use, changes in water quantity and quality, and wildlife conservation. The curriculum includes significant northern and native studies content, reflecting northern environmental, economic, and social contexts.

Students may complete up to 60 credits of appropriate coursework at Yukon College, University of Alberta or an equivalent institution before being admitted to the Northern ENCS program.

Students must complete a minimum of 60 credits of University of Alberta coursework while registered in the ENCS Program. Courses delivered in partnership with Yukon College will generally represent years 3 and 4 of the ENCS program.

Students may choose to spend some or all of years 3 and 4 taking courses at the University of Alberta campus in Edmonton. Students from Edmonton may also complete part of their program in Whitehorse.

## Courses

The Faculty of Agricultural, Life and Environmental Sciences courses are listed in Course Listings, under the following subject headings:

Agricultural and Resource Economics (AREC)  
Agricultural, Food and Nutritional Science (AFNS)  
Agricultural, Life and Environmental Sciences (ALES)  
Animal Science (AN SC)  
Environmental and Conservation Sciences (ENCS)  
Human Ecology (HECOL)  
Interdisciplinary Courses (INT D)  
Nutrition (NUTR)  
Nutrition and Food Sciences (NU FS)  
Plant Science (PL SC)  
Renewable Resources (REN R)  
Rural Sociology (R SOC)  
University (UNIV)  
Work Experience (WKEXP)

## Programs

## BA in Environmental Studies

### General Information

The Faculty of Agricultural, Life and Environmental Sciences and the Faculty of Arts have worked together to develop this degree which will educate students in the scientific, cultural, economic, moral, political and social dimensions of environmental issues. As the subject matter transcends the boundaries of any single discipline or faculty, this degree is offered through a collaborative program that draws on the Faculties of Native Studies and Science.

This degree will provide graduates with interdisciplinary expertise to identify, frame, and contribute to the solution of environmental problems. Graduates will

have a broad educational foundation in environmental studies, social studies and the humanities, for careers in law, business, economics, resource management, journalism as well as graduate education in either the professions or in research.

This program is not available as an After Degree..

### Program Requirements (★120)

#### Residency Requirements:

In the ★120 required to complete the degree, the following must be included:

- ★60 must be successfully completed at the U of A
- A minimum of ★30 must be taken while registered in the Faculty of Agricultural, Life and Environmental Sciences.

The following courses, comprising ★57, are common to all routes within the program:

#### Program Requirements (★120)

- AREC 173 - The Plate, the Planet and Society
  - AREC 200 - Current Economic Issues for Agriculture and Food **OR**
  - AREC 365 - Natural Resource Economics
  - BIOL 108 - Introduction to Biological Diversity
  - BIOL 208 - Principles of Ecology
  - EAS 205 - Environment Earth **OR**
  - EAS 204 - Environment Alberta
  - EAS 221 - Introduction to Geographical Information Systems and Remote Sensing **OR**
  - REN R 201 - Introduction to Geomatic Techniques in Natural Resource Management
  - ECON 101 - Introduction to Microeconomics
  - ENCS 352 - Natural Resource and Environmental Law
  - ★6 Junior ENGL
  - HIST 359 - Canadian Environmental History
  - ★3 Humanities (See Arts Chart 1, Group 2)
  - NS 200 - Aboriginal Canada: Looking Forward/Looking Back
  - PHIL 355 - Environmental Ethics
  - POL S 101 - Introduction to Politics
  - REN R 205 - Wildlife Biodiversity and Ecology **OR**
  - REN R 210 - Introduction to Soil Science and Soil Resources
  - SOC 291 - Introduction to Environmental Sociology
  - ★3 400-level capstone course
- ★3 from**
- ANTHR 230 - Anthropology of Science, Technology, and Environment
  - STS 200 - Introduction to Studies in Science, Technology and Society
  - HIST 294 - An Introduction to the History of Sciences, Technology, and Medicine

#### Additional Requirements

In addition to the courses listed above, students must complete a minimum of ★30 in additional course credits from one of the following concentrations: Environment and Peoples of Canada; Politics, Society & the Global Environment; or Food & Society. Courses taken to satisfy core requirements may not be counted towards the ★30 required for any concentration. There are ★33 credits in free electives.

## Environment and Peoples of Canada

### General Information:

This concentration brings together the diverse knowledge required to understand environmental challenges facing Canadians, including indigenous perspectives and issues in environmental and resource management.

## Requirements of the Concentration (★30)

Approved courses for this concentration are provided on Faculty websites. Other courses may be approved with permission from the academic advisor.

## Politics, Society & the Global Environment

### General Information:

This concentration introduces students to political and social methodologies relevant for understanding environmental issues from a global perspective.

## Requirements of the Concentration (★30)

Approved courses for this concentration are provided on Faculty websites. Other courses may be approved with permission from the academic advisor.

## Food & Society

### General Information:

This concentration is focused on sustainable food and agriculture, incorporating social, political, cultural, economic, ethical, and feminist perspectives on issues of contemporary food production.

## Requirements of the Concentration (★30)

Approved courses for this concentration are provided on Faculty websites. Other courses may be approved with permission from the academic advisor.

# BSc Honors in Food Science; BSc Honors in Nutrition; BSc in Nutrition and Food Science, General Program; BSc in Nutrition and Food Science, Dietetics Specialization; and BSc in Nutrition and Food Science, Food Science and Technology Specialization

### General Information

The Faculty offers courses leading to the degree of BSc Honors in Food Science, BSc Honors in Nutrition, BSc in Nutrition and Food Science, BSc in Nutrition and Food Science (Dietetics Specialization), and BSc in Nutrition and Food Science (Food Science and Technology Specialization). A minimum of ★120 is required to complete the program for the degree programs. The programs incorporate experiential learning into coursework to enable students to develop skills in nutrition and food science.

Honors programs are directed to highly-motivated students with exceptional ability. Two honors programs are available in the Faculty: BSc Honors in Food Science (see General Information) and BSc Honors in Nutrition (see Food Science, BSc Honors). Honors is the preferred program for students who aim for research-oriented careers or who plan to pursue graduate studies. Entrance to these programs takes place after at least one year of university (or equivalent) studies. The Honors in Food Science program meets the guidelines of the Institute of Food Technologists (IFT). Students normally complete their first year in the BSc Nutrition and Food Science General Program

The Nutrition and Food Science General Program (see Nutrition and Food Science, General Program, BSc) provides students with a diverse education in nutrition and food science. The General Program is the preferred program for students planning to complement a science-based education related to nutrition

and food with an interdisciplinary education related to health education, human ecology, food marketing, food quality and safety, or physical activity. Students in the General Program must complete one of the eight available minors (Food Marketing, Food Policy, Food Quality and Safety, Food Service Management, Human Ecology, Nutrition Communication and Education, Global Health, Physical Activity). Students normally select minors by the second year of their program to facilitate appropriate course selection. By completing a minor in Human Ecology, students can meet the educational requirements for registration as Professional Human Ecologists.

The Dietetics Specialization (see Nutrition and Food Science, Dietetics Specialization, BSc) is the program required for students pursuing a career as a Registered Dietitians. Students graduating with this Specialization meet the academic competencies and the internship requirements necessary to be eligible for registration with the College of Dietitians of Alberta. Entrance to this specialization takes place after at least one year of university preprofessional (or equivalent) studies. Students normally complete their preprofessional year in the BSc Nutrition and Food Science General Program.

The Food Science and Technology Specialization (see Nutrition and Food Science, Food Science and Technology Specialization, BSc) is the preferred program for students planning a career in the Food Industry and related government sectors. The Specialization meets the guidelines of the Institute of Food Technologists (IFT). Entrance to this specialization takes place after at least one year of university (or equivalent) studies. Students normally complete their first year in the BSc Nutrition and Food Science General Program.

## BSc Honors in Food Science

The BSc Honors in Food Science program prepares students for admission to Graduate school leading to a Master of Science (MSc) or a Doctor of Philosophy (PhD). Additionally, it prepares students for careers in the food industry and related government sectors that include applied research and product development, and scientific research. The Honors in Food Science program meets the guidelines of the Institute of Food Technologists (IFT).

Students will be assessed annually to ensure that they maintain a GPA of at least 3.0 in the previous Fall/Winter (see Continuation in the BSc Honors in Food Science and the BSc Honors in Nutrition). Students who fail to complete the requirements for a degree with Honors in the fourth year will be eligible for a degree in BSc Nutrition and Food Science, Specialization in Food Science and Technology or BSc Nutrition and Food Science, General Program provided that they meet the graduation requirements.

### Residence Requirement

A student transferring to the BSc Honors in Food Science program with advanced standing must complete at least ★60 (normally the last ★60) while registered in the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta.

### Course Requirements (★120)

Listed below are courses that fulfill the program requirements, and a recommended sequence for the courses.

#### Year 1

#### (normally taken in the BSc Nutrition and Food Science General Program)

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- 
- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- 
- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 
- MATH 114 - Elementary Calculus I
- NU FS 100 - Introduction to Food Science and Technology
- STAT 151 - Introduction to Applied Statistics I
- ★3 free elective

**Year 2**

- ALES 204 - Communication Fundamentals for Professionals
- BIOCH 200 - Introductory Biochemistry
- CHEM 211 - Quantitative Analysis I
- CHEM 263 - Organic Chemistry II
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- MICRB 265 - General Microbiology
- 
- NU FS 201 - Physical Principles of Food Structure and Functionality **OR**
- ★3 PHYS
- 
- NU FS 283 - Introduction to Food Engineering
- NU FS 372 - Food Chemistry

**Year 3**

- BIOCH 310 - Bioenergetics and Metabolism
- NU FS 305 - Introduction to the Principles of Nutrition
- NU FS 312 - Quality Assurance
- NU FS 353 - Unit Operations in Food Processing
- NU FS 361 - Food Microbiology
- NU FS 374 - Food Fundamentals and Quality
- NU FS 430 - Principles of Sensory Evaluation of Foods
- NU FS 454 - Unit Operations in Food Preservation
- ★3 free elective
- ★3 Approved Program Elective

**Years 4**

- AFNS 401 - Honors Seminar
- 
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- 
- ★9 Approved Program Electives selected from 300/400-level NU FS
- NU FS 407 (★6)
- NU FS 450 - Food Product Development
- NU FS 490 - Innovations in Food Science
- NU FS 499 - Advanced Agri-Chemical Analysis

**Note:** The Capstone course for Honors in Food Science is NU FS 450.

## BSc Nutrition and Food Science, Nutrition Major

**Note:** The last admission to the Nutrition Major will take place in Fall 2015. Students interested in Dietetics will apply to the Dietetics Specialization for Fall 2016. Students enrolled in the Nutrition Major will be allowed to finish their program no later than the 2019-2020 academic year.

The goal of the Nutrition Major is to provide students with a specialized academic program in nutritional science and the related physical, health and social sciences. It incorporates experiential learning into coursework to enable students to develop skills in nutritional science.

The Nutrition major prepares students for careers in general health sciences, dietetics, health promotion, education, private practice, government and health protection agencies, research and nutrition development. Appropriate selection of Free Electives (★6 Physics) will provide the required courses for application to Medicine.

The Nutrition major, with appropriate Approved Program Electives, is accredited by the College of Dietitians of Alberta (see Integrated Dietetic Internship). Students registered in this major can meet the academic competencies to be eligible for either the Integrated Dietetic Internship or post-degree internships.

Students will be assessed annually to ensure that they maintain a GPA of at least 3.0 in the previous Fall/Winter..

### Requirements of the BSc in Nutrition and Food Science Program (★60)

- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 

- ALES 204 - Communication Fundamentals for Professionals
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- 
- BIOCH 200 - Introductory Biochemistry
- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- 
- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- 
- CHEM 263 - Organic Chemistry II
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- 
- NU FS 361 - Food Microbiology **OR**
- NU FS 363 - Food Microbiology
- 
- NU FS 372 - Food Chemistry **OR**
- NU FS 373 - Food Chemistry
- 
- STAT 151 - Introduction to Applied Statistics I
- ★3 Capstone course (NUTR 401)
- ★12 Free Electives (see Note 3)

### Requirements of the Major (★60)

- BIOCH 310 - Bioenergetics and Metabolism (see grade requirements for admission to this course)
- BIOL 207 - Molecular Genetics and Heredity
- NU FS 223 - The Cultural Ecology of Food and Health
- NU FS 356 - Nutrition Across the Lifespan
- NU FS 377 - Introduction to Nutrition in the Community
- NUTR 468 - Clinical Nutrition
- NUTR 100 - Nutrition and Wellbeing
- NUTR 301 - Fundamentals of Nutritional Biochemistry and Metabolism I
- NUTR 302 - Fundamentals of Nutritional Biochemistry and Metabolism II
- NUTR 400 - Research Methods in Nutritional Science
- NUTR 440 - Current Topics in Nutritional Science
- PHYSL 210 - Human Physiology
- ★12 Approved Program Electives

#### ★9 from

- NUTR 443 - Diabetes, Cardiovascular Disease and Lifestyle
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 476 - Advanced Clinical Nutrition
- NUTR 477 - Advanced Community Nutrition
- NUTR 478 - Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins
- NUTR 479 - Advanced Nutrition: Vitamins and Inorganic Elements
- NUTR 380 - Sports Nutrition
- NU FS 310 - Teaching and Communication in Nutrition
- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome

### Integrated Dietetic Internship:

Eligible students may apply for the Integrated Dietetic Internship once course requirements are met. See Note 1. In this internship, academic terms alternate with internship terms in cooperation with health care facilities throughout Alberta; the degree plus internship can be completed in approximately five years and then the student is eligible for registration with the College of Dietitians of Alberta and membership in Dietitians of Canada. Students admitted to the U of A Integrated Dietetic Internship are required to maintain undergraduate registration and complete NUTR 466, NUTR 469, NUTR 470, NUTR 471 and NUTR 472 prior to convocation.

Students who wish to become Registered Dietitians must complete the Nutrition major, the specific additional undergraduate course requirements noted below and a dietetic internship (see Notes). These additional ★15 may be taken as Approved Program Electives or Free Electives in the Nutrition major.

### Required Course List for Dietetics Students (★15)

- NT D 410 - Interprofessional Health Team Development (See Note 2)
- NU FS 374 - Food Fundamentals and Quality
- NU FS 461 - Foodservice Systems Management
- NUTR 476 - Advanced Clinical Nutrition

**★3 Approved Program Elective chosen from**

- NU FS 310 - Teaching and Communication in Nutrition
- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome
- NUTR 443 - Diabetes, Cardiovascular Disease and Lifestyle
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 477 - Advanced Community Nutrition
- NUTR 478 - Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins
- NUTR 479 - Advanced Nutrition: Vitamins and Inorganic Elements

**Notes**

1. Students planning to apply for the University of Alberta Integrated Dietetic Internship must have successfully completed NUTR 468 and have successfully completed or be registered in NU FS 377 and NU FS 461 for the upcoming academic year.
2. Students must have completed NU FS 468 or NUTR 468 prior to registering in INT D 410.

Under the *Protection for Persons in Care Act*, all students going to any clinical placement in Alberta are required to complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. Clinical agencies/practice sites may require additional background checks, such as a Child Intervention Record Check. Students will be advised if a clinical agency/practice site requires any additional background checks.

## BSc Honors in Nutrition

The BSc Honors in Nutrition provides students with a specialized academic program in nutritional science and the related physical, health and social sciences. The Honors in Nutrition prepares students for admission to Graduate school leading to a Master of Science (MSc) or a Doctor of Philosophy (PhD). In addition, it prepares students for careers in general health sciences, health promotion, education, government and health protection agencies, research and nutrition development.

Students will be assessed annually to ensure that they maintain a GPA of at least 3.0 in the previous Fall/Winter [see Continuation in the BSc Honors in Food Science and the BSc Honors in Nutrition]. A student who completes the requirements for a degree with Honors in the fourth year but fails to maintain a graduating GPA of 3.0 will be eligible for a degree in BSc Nutrition and Food Science, General Program, provided they meet the graduation requirements.

### Residence Requirement

A student transferring to the BSc Honors in Nutrition program with advanced standing must complete at least ★60 (normally the last ★60) while registered in the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta.

### Course Requirements (CE120)

Listed below are courses that fulfill the program requirements, and a recommended sequence for the courses.

**Year 1****(normally taken in the BSc Nutrition and Food Science General Program)**

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- ★6 ENGL **OR**
- ★3 ENGL AND ★3 WRS
- NUTR 100 - Nutrition and Wellbeing
- NU FS 100 - Introduction to Food Science and Technology
- STAT 151 - Introduction to Applied Statistics I
- ★3 free elective

**Year 2**

- ALES 204 - Communication Fundamentals for Professionals
- BIOCH 200 - Introductory Biochemistry
- CHEM 263 - Organic Chemistry II
- MICRB 265 - General Microbiology
- NU FS 223 - The Cultural Ecology of Food and Health
- NU FS 250 - Applied Food Theory
- NU FS 372 - Food Chemistry
- PHYSYL 210 - Human Physiology **OR**
- PHYSYL 212 - Human Physiology I **AND**
- PHYSYL 214 - Human Physiology II
- ★3 Free elective

**Year 3**

- BIOCH 310 - Bioenergetics and Metabolism
- NU FS 356 - Nutrition Across the Lifespan
- NU FS 377 - Introduction to Nutrition in the Community
- NUTR 301 - Fundamentals of Nutritional Biochemistry and Metabolism I
- NUTR 302 - Fundamentals of Nutritional Biochemistry and Metabolism II
- NUTR 468 - Clinical Nutrition
- STAT 252 - Introduction to Applied Statistics II
- ★3 Approved Program Elective
- ★3 Free elective

**★3 of**

- IMIN 371 - Introduction to Immunology
- NU FS 361 - Food Microbiology

**Years 4**

- NUTR 400 - Research Methods in Nutritional Science
- ★6 NUTR 401 - Undergraduate Nutritional Science Independent Project
- NUTR 440 - Current Topics in Nutritional Science (Capstone)
- ★3 Approved Program Electives
- ★3 Free elective

**★12 of**

- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome
- NU FS 430 - Principles of Sensory Evaluation of Foods
- NU FS 499 - Advanced Agri-Chemical Analysis
- NUTR 443 - Diabetes, Cardiovascular Disease and Lifestyle
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 476 - Advanced Clinical Nutrition
- NUTR 477 - Advanced Community Nutrition
- NUTR 478 - Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins
- NUTR 479 - Advanced Nutrition: Vitamins and Inorganic Elements

## BSc Nutrition and Food Science, General Program

The General Program in Nutrition and Food Science provides students with a diverse education in human nutrition and food science. Graduates have a working knowledge of the fundamentals of nutritional science coupled with basic knowledge in applied chemistry and microbiology as it pertains to food manufacturing, preservation, storage and distribution. This degree integrates a sound scientific education with course work related to applied economics, sociology and education, and applied science.

Students in the BSc Nutrition and Food Science, General Program must select one of the minors available in the program. Students are encouraged to discuss their course selection with their academic advisor.

Graduates may find employment opportunities in a variety of public or private enterprises including health education, the health industry, community and non-government/charitable organizations or international aid. Careers can be further directed by the selection of a minor in Food Marketing, Food Policy, Food Safety and Quality, Food Service Management, Human Ecology, Nutrition Communication and Education, Global Health, or Physical Activity. Minors help position graduates for careers in lifestyle management, the community-based human ecology sector, policy-making bodies in government or non-government

institutions, or the food industry and food service management. Students normally select minors by the second year of their program to facilitate appropriate course selection.

Students in the General Program may transfer to the Honors in Food Science or Honors in Nutrition programs, the Dietetics Specialization, or the Food Science and Technology Specialization if they meet the admission requirements. This transfer is normally done after the first year (see BSc Honors in Food Science to BSc in Nutrition and Food Science, Food Science and Technology Specialization). Students who transfer after their first year often require more than four years to complete the entire program.

## Residence Requirement

A student registered in the BSc Nutrition and Food Science, General Program must complete at least ★60 (normally the last ★60) while registered in the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta.

## Course Requirements (CE120)

Listed below are courses that fulfill the program requirements, and a recommended sequence for the courses.

### Year 1

(normally taken in the BSc Nutrition and Food Science General Program)

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- 

- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- 

- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 

- NUTR 100 - Nutrition and Wellbeing
- NU FS 100 - Introduction to Food Science and Technology
- STAT 151 - Introduction to Applied Statistics I

#### ★3 from

- (see Note 1)
- AN SC 100 - Introduction to Animal Health Science
- ANTHR 101 - Introductory Anthropology
- AREC 173 - The Plate, the Planet and Society
- ECON 101 - Introduction to Microeconomics
- HE ED 110 - Introduction to Personal Health and Well-Being
- HECOL 100 - Introduction to Principles and Practice in Human Ecology
- MATH 114 - Elementary Calculus I
- PSYCO 104 - Basic Psychological Processes
- SOC 100 - Introductory Sociology

### Year 2

- ALES 204 - Communication Fundamentals for Professionals
- 

- BIOCH 200 - Introductory Biochemistry **OR**
- PL SC 331
- 

- CHEM 263 - Organic Chemistry II
- NU FS 223 - The Cultural Ecology of Food and Health
- NU FS 250 - Applied Food Theory
- 

- NU FS 372 - Food Chemistry **OR**
- NU FS 373 - Food Chemistry
- 

- PHYSL 210 - Human Physiology
- ★3 Free elective

#### ★3 from

- ANAT 200 - Human Morphology
- ANTHR 207 - Introduction to Social and Cultural Anthropology
- BIOL 207 - Molecular Genetics and Heredity
- NU FS 200 - Introduction to Functional Foods and Nutraceuticals
- NU FS 201 - Physical Principles of Food Structure and Functionality
- NU FS 311 - Introduction to Food Processing
- PHYS 124 - Particles and Waves

- PMCOL 201 - Introductory Pharmacology

### Year 3

- NU FS 305 - Introduction to the Principles of Nutrition
- NU FS 356 - Nutrition Across the Lifespan
- 
- NU FS 361 - Food Microbiology **OR**
- NU FS 363 - Food Microbiology
- 
- ★12 minor requirements or Approved Program Elective from 300/400 level courses
- 
- ★3 Free Elective

#### ★3 from

- ACCTG 300 - Introduction to Accounting
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses
- SMO 301 - Behavior in Organizations

#### ★3 from

- (see Note 2)
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Nutrition in the Community

### Year 4

(see Note 3)

- NU FS 425 - Methods and Applications in Nutritional Product Development and Quality Assurance **OR**
- NU FS 458 - Current Topics and Controversies in Nutrition
- 

- ★12 minor requirements or Approved Program Elective from 300/400 level courses
- 

- ★3 Free Elective

#### ★12 from

- NU FS 310 - Teaching and Communication in Nutrition
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Nutrition in the Community
- NU FS 402 - Brewing, Enology, and Food Fermentations
- NU FS 403 - Processing of Milk and Dairy Products
- NU FS 404 - Muscle Food Science and Technology
- NU FS 406 - Science and Technology of Cereal and Oilseed Processing
- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 427 - Food Safety
- NU FS 430 - Principles of Sensory Evaluation of Foods
- NU FS 436 - Advanced Topics in Nutrition
- NU FS 454 - Unit Operations in Food Preservation
- NU FS 461 - Foodservice Systems Management
- NU FS 480 - Foodborne Pathogens
- NU FS 481 - Advanced Foods
- NU FS 499 - Advanced Agri-Chemical Analysis
- NUTR 380 - Sports Nutrition
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 477 - Advanced Community Nutrition

### Notes

1. Students should refer to the requirements of their chosen Minor or to the requirements of their intended Specialization area (i.e., Dietetics or Food Science and Technology), to ensure that they select the appropriate courses required for that area of study.
2. A course can only be counted once in the Program
3. The Capstone course for the BSc Nutrition and Food Science General Program is normally (NU FS 425 or NU FS 458). Students in some minors may select an alternative capstone course.

## Minors in the BSc Nutrition and Food Science General Program

Students in the BSc Nutrition and Food Science General Program are required to choose a minor that incorporates applicable course work into their program. Minors should be selected by the end of the first year of study.

## Minor in Food Marketing

A minor in Food Marketing provides the opportunity to apply a nutrition and food science background to consumer behavior and food marketing.

Requirements for the Minor (★27) include some courses selected within the General Program Core

- AREC 200 - Current Economic Issues for Agriculture and Food
- AREC 384 - Food Market Analysis
- AREC 484 - Strategic Management in Food and Resource Businesses
- ECON 101 - Introduction to Microeconomics
- NU FS 201 - Physical Principles of Food Structure and Functionality
- NU FS 311 - Introduction to Food Processing
- NU FS 374 - Food Fundamentals and Quality

### ★6 from

- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses (if not taken to fulfill program core)
- AREC 473 - Food and Agricultural Policies
- AREC 482 - Cooperatives and Alternative Business Institutions
- AREC 485 - Trade and Globalization in Food and Resources

**Note:** AREC 423 is an alternative capstone course for this minor

## Minor in Food Policy

A minor in Food Policy provides the opportunity to apply a nutrition and food science background to issues related to health and food from a health, fiscal and agricultural policy perspective

Requirements for the Minor (★27) include some courses selected within the General Program Core.

- AREC 200 - Current Economic Issues for Agriculture and Food
- AREC 471 - Society and Well-Being
- AREC 473 - Food and Agricultural Policies
- ECON 101 - Introduction to Microeconomics
- HECOL 300 - Policy Development and Evaluation
- NU FS 201 - Physical Principles of Food Structure and Functionality
- NU FS 311 - Introduction to Food Processing
- NU FS 374 - Food Fundamentals and Quality
- R SOC 271 - The Politics of Food and Natural Resources

**Note:** AREC 423 is an alternative capstone course for this minor

## Minor in Food Safety and Quality

A minor in Food Safety and Quality provides the opportunity to apply a nutrition and food science background to aspects related to food safety, food quality assurance, and food product development

Requirements for the Minor (★30) include some courses selected within the General Program Core..

- NU FS 201 - Physical Principles of Food Structure and Functionality
- NU FS 311 - Introduction to Food Processing
- NU FS 312 - Quality Assurance
- NU FS 374 - Food Fundamentals and Quality
- NU FS 427 - Food Safety
- NU FS 430 - Principles of Sensory Evaluation of Foods
- NU FS 480 - Foodborne Pathogens
- NU FS 450 - Food Product Development (taken as capstone course)

### ★6 of

- NU FS 402 - Brewing, Enology, and Food Fermentations
- NU FS 403 - Processing of Milk and Dairy Products
- NU FS 404 - Muscle Food Science and Technology
- NU FS 406 - Science and Technology of Cereal and Oilseed Processing
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome
- NU FS 481 - Advanced Foods

## Minor in Food Service Management

A minor in Food Service Management combines a nutrition and food science background to issues related to business management, human resources, and quality assurance as appropriate for a career in the food service industry.

Requirements for the Minor (★24) include some courses selected within the General Program Core.

- AACCTG 300 - Introduction to Accounting
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses (see Note 1)
- AREC 484 - Strategic Management in Food and Resource Businesses (see

Note 1)

- NU FS 312 - Quality Assurance
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Nutrition in the Community
- NU FS 461 - Foodservice Systems Management

### ★3 of

- SMO 200 - Introduction to Management for Non-Business Students
- SMO 301 - Behavior in Organizations
- OM 352 - Operations Management

**Note:** Students should select AREC 323 within the BSc Nutrition and Food Science, General Program

## Minor in Human Ecology

A minor in Human Ecology provides the opportunity to acquire knowledge and skills for developing, delivering and evaluating programs and services that enhance the well-being of individuals and families. Students who complete this minor may be eligible to apply for the registered designation of Professional Human Ecologist (information available from 3-02 HEB). This minor also provides access to the Human Ecology Practicum Program (HECOL 408 and HECOL 409) and through careful selection of courses and use of free electives, as well as approval of the Department of Human Ecology, a student can complete a practicum in a community agency that links with their career goals

Requirements for the Minor (★27) include some courses selected within the General Program Core.

- HECOL 100 - Introduction to Principles and Practice in Human Ecology
- HECOL 301 - Program Planning and Evaluation
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Nutrition in the Community
- NU FS 461 - Foodservice Systems Management

### ★12 of

- HECOL 201 - Introduction to Material Culture
- HECOL 210 - Intimate Relationships
- HECOL 212 - Later Life Families
- HECOL 300 - Policy Development and Evaluation
- HECOL 310 - Parent-Child Relationships
- HECOL 313 - Family Dynamics
- HECOL 315 - Interviewing and Counseling
- HECOL 321 - Introduction to Family Finance
- HECOL 322 - Family Economic Issues
- HECOL 408 - Intentional Professional Practice
- HECOL 412 - Family Challenges
- HECOL 414 - Seniors and Their Environments
- HECOL 440 - Family Policy Issues
- HECOL 443 - Family Law

### Notes

1. Students choosing to participate in the Human Ecology Practicum Program are required to take HECOL 408 as part of the minor requirements, and ★6 HECOL 409 as free elective. HECOL 408 and HECOL 409 must be taken in sequence in the final year of study and an application is required. Please contact the Human Ecology practicum coordinator regarding application and registration in HECOL 408 and HECOL 409.
2. There are potential course scheduling conflicts between HECOL and NU FS courses. Students should discuss course selections with their academic advisor early in their program and on an annual basis to avoid these conflicts.

## Minor in Nutrition Communication and Education

A minor in Nutrition Communication and Education provides the opportunity to apply knowledge in nutrition communication and education to the planning and delivery of a broader range of educational programs.

Requirements for the Minor (★21) include some courses selected within the General Program Core.

- HECOL 301 - Program Planning and Evaluation
- HE ED 110 - Introduction to Personal Health and Well-Being
- HE ED 320 - Social Dimensions of Health and Health Promotion
- NU FS 310 - Teaching and Communication in Nutrition
- NU FS 436 - Advanced Topics in Nutrition
- NUTR 477 - Advanced Community Nutrition

### ★3 of

- HECOL 210 - Intimate Relationships

- HECOL 310 - Parent-Child Relationships
- HECOL 313 - Family Dynamics
- HECOL 315 - Interviewing and Counseling

## Minor in Global Health

A minor in Global Health provides students with the opportunity to apply knowledge in human nutritional science to issues that are relevant to food availability and accessibility, dietary intake, nutritional status, food security, and food policy across the global community.

Requirements for the Minor (★24) include some courses selected within the General Program Core.

- AREC 375 - World Food and Agriculture
- AREC 471 - Society and Well-Being
- ANTHR 207 - Introduction to Social and Cultural Anthropology
- ANTHR 372 - Anthropology of Food
- ECON 101 - Introduction to Microeconomics
- INT D 404 - Global Citizenship: Contemporary Issues and Perspectives
- NU FS 377 - Introduction to Nutrition in the Community
- R SOC 271 - The Politics of Food and Natural Resources

### ★3 from

- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome
- NU FS 436 - Advanced Topics in Nutrition
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 477 - Advanced Community Nutrition

## Minor in Physical Activity

A minor in Physical Activity provides the opportunity to integrate nutrition and food sciences with health, health education, and physical activity.

Requirements for the Minor (★18) include some courses selected within the General Program Core.

- HE ED 110 - Introduction to Personal Health and Well-Being
- HE ED 220 - Introduction to the Biological Aspects of Fitness to Health
- HE ED 321 - Psychological Dimensions of Health Promotion
- NU FS 377 - Introduction to Nutrition in the Community
- NUTR 380 - Sports Nutrition

### ★3 of

- HE ED 221 - Population Health
- KIN 391 - Introduction to Human Anatomy and Physiology
- PERLS 104 - Introduction to Sociology of Sport and Leisure in Canadian Society
- RLS 100 - Life, Leisure, and the Pursuit of Happiness

# BSc Nutrition and Food Science, Dietetics Specialization

**Note:** Interested students should apply to the BSc Nutrition and Food Science, Nutrition Major for Fall 2015. Applications for the Dietetics Specialization will open for Fall 2016.

The BSc Nutrition and Food Science, Dietetics Specialization prepares students for a career as a Registered Dietitian. The Dietetics Specialization enables students to acquire both the knowledge and practical skills needed to be eligible to practice as a Registered Dietitian or Registered Nutritionist.

Registered Dietitians/Registered Nutritionists are uniquely trained food and nutrition experts. As essential members of the interprofessional healthcare team, they contribute to health and well-being by translating scientific, medical and nutrition information into practical individualized therapeutic diets and meal plans for people. Registered Dietitians/Registered Nutritionists manage nutrition for health promotion, disease prevention, and treatment of acute and chronic diseases. They provide information and counseling that enables consumers to make informed decisions about food choices and nutrition services. Registered Dietitians also influence the development and promotion of consumer products and manage nutrition and food services in healthcare institutions.

The Dietetics Specialization curriculum includes courses from the Faculty of Agricultural, Life and Environmental Sciences as well as those from other University of Alberta programs of study. During their second, third and fourth

years in the specialization, students participate in professional practice or field experiences in various community settings, such as hospitals, foodservice operations, schools, and community agencies/clinics. Experience in rural settings is required. Students admitted to the Dietetics Specialization are also required to complete a minimum ★3 course work in interprofessional health team development and/or practice. Some evening course work as well as evening, weekend and/or early morning shifts while engaged in professional practice learning may be required.

Completion of the BSc in Nutrition and Food Science, Dietetics Specialization achieves the minimum academic and practical training requirements accepted by the College of Dietitians of Alberta for registration to practice dietetics in Alberta. To register as a Dietitian in Alberta, a graduate must complete all of the requirements of the specialization including the professional practice courses. In addition to completing the requirements of the BSc in Nutrition and Food Science, Dietetics Specialization, graduates must successfully complete the Canadian Dietetics Registration Examination (CDRE) administered by the Alliance of Canadian Dietetic Regulatory Bodies. Information concerning the CDRE and/or registration requirements for dietitians in Alberta can be obtained from the Registrar, College of Dietitians of Alberta, 1320, 10123 99 Street, Edmonton, Alberta T5J 3H1.

## Faculty Accreditation

The BSc in Nutrition and Food Science, Dietetics Specialization program at the University of Alberta has been approved by the College of Dietitians of Alberta.

## Admission, Academic Standing and Graduation

Entrance to this program takes place after at least one preprofessional year of university (or equivalent) studies. Students normally complete their preprofessional year in the BSc Nutrition and Food Science General Program. See BSc in Nutrition and Food Science, Dietetics Specialization for details on the admission requirements.

Students will be assessed annually to ensure that they maintain a GPA of 2.7 and passing grades in the professional practice courses [see Continuation in the BSc Nutrition and Food Science Dietetics Specialization and the BSc Nutrition and Food Science, Food Science and Technology Specialization ]. Students who complete the course requirements for a degree with the Dietetics Specialization in the fourth year but fail to maintain a graduating GPA of 2.7 will be eligible for a degree BSc Nutrition and Food Science, General Program provided that they meet the graduation requirements.

## Professional Practice Requirements

Note: For updates on changes to health and safety requirements refer to the Faculty of Agricultural, Life and Environmental Sciences website at: [www.ales.ualberta.ca](http://www.ales.ualberta.ca)

- Immunization:** See University Infectious Diseases Regulation.
- Police Information Check:** Under the Protection for Persons in Care Act, all students going to any clinical placement in Alberta are required to complete a Police Information Check (also known as a Criminal Record Check, Security Clearance Check, or Police Clearance), which must include a Vulnerable Sector Check. Clinical agencies/practice sites may require additional background checks, such as a Child Intervention Record Check. Students will be advised if a clinical agency/practice site requires any additional background checks. This includes students in the Dietetic Specialization who are placed in any of these designated agencies.

The host agency will determine the criteria for acceptance/denial of an intern placement. Students enrolled in the Dietetic Specialization are responsible for having a Police Information Check completed prior to commencement of their professional practice placements. See Requirement for Police Information Checks for more information on the general requirements concerning Police Information Checks and the fees associated with them.

Students who have concerns related to their ability to provide a clear Police Information Checks should consult with the Director, Dietetic Internship immediately upon being admitted to the program.

The ultimate responsibility for ensuring that the requirements of a placement site are met lies with the student. Students should be aware that in addition to the Police Information Check, other background checks may be required by a placement agency, such as a child intervention record check. Students will be advised if any additional background checks are required by a clinical agency.

c. **Respiratory Mask Fit Testing:** Prior to all clinical practice placements, students must be fitted for N95 Respiratory Masks in accordance with the contractual placement agreements with Alberta Health Services and other placement sites. These masks are worn when caring for patients with highly infectious diseases. The Faculty of Agricultural, Life and Environmental Sciences coordinates mask fit testing and will notify students of fitting dates. A fee may be charged for mask fit testing. This fee is the responsibility of the student.

## Professional Practice Requirements

a. **Professional Ethics, Standards of Practice or Care, Policies and Procedures:** All students enrolled in the Dietetics Specialization are bound by, and shall comply with the Professional Codes of Ethics governing the profession and practice of Dietetics, as well as the policies and procedures of the placement site and those of the Dietetics Specialization:

- “Professional Codes of Ethics” means the current College of Dietitians of Alberta’s Code of Ethics for Registered Dietitians and Registered Nutritionists, as well as all other relevant professional codes and practice standards for Registered Dietitians.
- It is the responsibility of all students enrolled in the Dietetics Specialization to obtain, and be familiar with, such Professional Codes of Ethics, and their amendments as may be made from time to time.
- Students enrolled in professional practice placement courses are required to follow the administrative procedures and regulations (including dress requirements) of the placement site. Students are responsible for their transportation to practice placements and for the costs of travel and accommodations.
- For current information on the policies and procedures of the Dietetics Specialization, refer to the Faculty of Agricultural, Life and Environmental Sciences website at: [www.ales.ualberta.ca](http://www.ales.ualberta.ca).

b. **Practicum Intervention Policy:** The Dean, or supervisor acting on behalf of the Dean, may immediately deny assignment of a student to, withdraw a student from, or vary terms, conditions or site of a practicum/clinical placement if the Dean or supervisor has reasonable grounds to believe that this is necessary in order to protect the public interest. (See Practicum Intervention Policy and Practicum Intervention Policy.) For unprofessional, incompetent or unsafe practice on the part of the student not directly related to medical issues, the transcript will reflect the practices and sanctions delineated in the Code of Student Behaviour. Amendments to the Code of Student Behaviour occur throughout the year. The official version of the Code of Student Behaviour, as amended from time to time, is housed on the University Governance website at [www.governance.ualberta.ca](http://www.governance.ualberta.ca). The student has the right to appeal the Dean’s decision to the GFC Practice Review Board (PRB).

c. **Clinical and Professional Practice Performance:**

- Students must complete both theory and professional practice work in order to receive credit. Students who have not received a pass in the clinical/professional practice portion of a professional practice course are not given credit for the course and must repeat both the clinical and non-clinical portions of the course. The clinical component, explained in the course outline, must be completed for credit to be granted.
- A student who is absent more than one clinical day in any one clinical course may need to make up the lost time before being allowed to continue in the program.
- Students who fail the same professional practice course twice will be required to withdraw from the Specialization.

d. **Rural Placement Requirement:** All students enrolled in the Dietetics Specialization are required to relocate to rural centres across Alberta on one or more occasions during their professional practice course work in order to acquire an understanding of this setting.

- “Rural” is defined as towns or municipalities outside the commuting zone of larger urban centres (with 10,000 or more population).
- Access to transportation and accommodation is not considered in arranging rural professional practice placements. The student is responsible for transportation to and from work each day and for finding their own accommodation while engaged in all professional practice courses.
- All costs associated with relocation to rural centres are the responsibility of the student. This includes transportation, accommodations, food, clothing, and learning resources.

e. **Accommodation for Persons with Disabilities:** The Faculty of Agricultural, Life and Environmental Sciences supports the principle of accommodation and all reasonable efforts to meet the disability-related needs of students enrolled in the Dietetics Specialization. Student’s in need of accommodations must submit a written request for and formalize a professional practice accommodation plan one term prior to the planned start of a professional practice course. Detailed information on the Faculty’s policies and procedures related to accommodations during professional practice courses can be obtained from the Faculty Student Services Office.

## Residence Requirement

A student transferring to the Dietetics Specialization must complete at least ★60 (normally the last ★60) while registered in the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta.

### Preprofessional Year

(normally taken in the BSc Nutrition and Food Science, General Program)

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- 
- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- 
- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 
- NUTR 100 - Nutrition and Wellbeing
- NU FS 100 - Introduction to Food Science and Technology
- STAT 151 - Introduction to Applied Statistics I
- ★3 free elective

**Note:** Credit acquired during the preprofessional year does not count towards the degree requirements for the BSc in Nutrition and Food Science, Dietetics Specialization. The required admission courses to be taken during the preprofessional year are shown here for information and program planning purposes only.

## Course Requirements (★120)

Listed below are courses required to fulfill the program requirements, and a recommended sequence of the courses:

Course sequencing for Professional Practice in Dietetics courses may vary based on the availability of placement sites.

### Year 1

- ACCTG 300 - Introduction to Accounting
- BIOCH 200 - Introductory Biochemistry
- CHEM 263 - Organic Chemistry II
- NU FS 223 - The Cultural Ecology of Food and Health
- NU FS 250 - Applied Food Theory
- NU FS 363 - Food Microbiology
- NUTR 201 - Role of the Dietitian in the Canadian Health Care System
- PHYSL 210 - Human Physiology
- ★3 Approved Program Elective

### Year 2

#### Fall/Winter

- BIOCH 310 - Bioenergetics and Metabolism
- NU FS 356 - Nutrition Across the Lifespan
- NU FS 373 - Food Chemistry
- NU FS 374 - Food Fundamentals and Quality
- NU FS 377 - Introduction to Nutrition in the Community
- NUTR 301 - Fundamentals of Nutritional Biochemistry and Metabolism I
- NUTR 302 - Fundamentals of Nutritional Biochemistry and Metabolism II
- NUTR 468 - Clinical Nutrition
- NUTR 482 - Introduction to Dietetic Practice

#### Spring / Summer

- NUTR 483 - Introductory Professional Practice In Clinical Dietetics

### Year 3

#### Fall/Winter

- INT D 410 - Interprofessional Health Team Development



- NU FS 461 - Foodservice Systems Management
- NUTR 400 - Research Methods in Nutritional Science
- NU FS 450 - Food Product Development
- NUTR 476 - Advanced Clinical Nutrition
- SMO 200 - Introduction to Management for Non-Business Students
- SMO 311 - HRM: Managing the Work Force in Canada
- ★3 Approved Program Electives

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**★6 of**


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- must be completed in Year 3
- NU FS 310 - Teaching and Communication in Nutrition
- NU FS 424 - Nutrition and Metabolism Related to Cancer
- NU FS 428 - Advances in Human Nutrition and the Intestinal Microbiome
- NUTR 443 - Diabetes, Cardiovascular Disease and Lifestyle
- NUTR 452 - Nutrition in the Prevention of Chronic Human Diseases
- NUTR 477 - Advanced Community Nutrition
- NUTR 478 - Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins
- NUTR 479 - Advanced Nutrition: Vitamins and Inorganic Elements

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**Spring / Summer**


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**Two of**


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- NUTR 484 - Professional Practice In Community Nutrition I
- NUTR 485 - Professional Practice In Community Nutrition II
- NUTR 486 - Professional Practice In Foodservice and Management I
- NUTR 487 - Professional Practice In Foodservice and Management II

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**Year 4**


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- NUTR 488 - Professional Practice In Clinical Dietetics

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**Two of**


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- NUTR 484 - Professional Practice In Community Nutrition I
- NUTR 485 - Professional Practice In Community Nutrition II
- NUTR 486 - Professional Practice In Foodservice and Management I
- NUTR 487 - Professional Practice In Foodservice and Management II

**Note:** The Capstone course for the Dietetics Specialization is NUTR 450.

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## BSc Nutrition and Food Science, Food Science and Technology Specialization

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The Food Science and Technology Specialization prepares students for careers in the food industry and related government sectors. The Specialization meets the guidelines of the Institute of Food Technologists (IFT). This academic program focuses on applying chemistry, microbiology, and engineering to the food systems and technological processes used in food manufacturing, preservation, storage, and distribution. Graduates of this specialization may enter the food industry as technical specialists or quality control managers. Opportunities also exist in government employment as inspectors, laboratory managers, and extension workers; in international development agencies; and in private laboratories providing consultative or technical service to the food industry and food marketing chains.

Students who complete the course requirements for the Food Science and Technology Specialization but fail to maintain a graduating grade point average of 2.7 will be eligible for a degree in BSc Nutrition and Food Science, General Program, provided they meet the graduation requirements.

### Residence Requirement

A student transferring to the Food Science and Technology Specialization must complete at least ★60 (normally the last ★60) while registered in the Faculty of Agricultural, Life and Environmental Sciences at the University of Alberta

### Course Requirements (★120)

Listed below are courses required to fulfill the program requirements, and a recommended sequence of the courses:

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**Year 1**


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**(normally taken in the BSc Nutrition and Food Science General Program)**

- BIOL 107 - Introduction to Cell Biology
- CHEM 101 - Introductory University Chemistry I
- CHEM 102 - Introductory University Chemistry II
- 

- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- 

- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 

- MATH 114 - Elementary Calculus I
- NU FS 100 - Introduction to Food Science and Technology
- STAT 151 - Introduction to Applied Statistics I
- ★3 Free elective

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**Year 2**


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- ALES 204 - Communication Fundamentals for Professionals
- BIOCH 200 - Introductory Biochemistry
- CHEM 211 - Quantitative Analysis I
- CHEM 263 - Organic Chemistry II
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- MICRB 265 - General Microbiology
- 

- NU FS 201 - Physical Principles of Food Structure and Functionality **OR**
- ★3 PHYS
- 

- NU FS 283 - Introduction to Food Engineering
- NU FS 372 - Food Chemistry

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**Year 3**


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- NU FS 305 - Introduction to the Principles of Nutrition
- NU FS 312 - Quality Assurance
- NU FS 353 - Unit Operations in Food Processing
- NU FS 361 - Food Microbiology
- NU FS 374 - Food Fundamentals and Quality
- NU FS 430 - Principles of Sensory Evaluation of Foods
- NU FS 454 - Unit Operations in Food Preservation
- ★6 Approved Program Elective
- ★3 Free elective

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**Year 4**


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- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- 

- NU FS 401 - Undergraduate Research Project (see Note) **OR**
- WKXP 986 - Food Science and Technology Work Experience
- 

- NU FS 450 - Food Product Development (see Note)
- NU FS 490 - Innovations in Food Science (see Note)
- NU FS 499 - Advanced Agri-Chemical Analysis (see Note)
- ★9 Approved Program Electives selected from 300/400-level NU FS
- ★3 Approved Program Elective
- ★3 Free elective

**Note:** The Capstone course for the Food Science and Technology Specialization is NU FS 450.

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## BSc in Agricultural/Food Business Management

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### General Information

This program is for students interested in applying business skills and tools to management of organizations in the agriculture and food industries. Agricultural/Food Business Management graduates develop a strong understanding of

business concepts and principles applied to these sectors and have a basic knowledge of the scientific processes involved.

The program provides the background for a career in an agricultural or food business setting. Graduates may choose careers in management, sales or finance, but they also have the ability to interact comfortably with technical specialists and have a good understanding of the products and processes with which they are involved. Graduates may become scientists and technical specialists with a deeper understanding of business management.

The program is offered jointly by the Faculty of Agricultural, Life and Environmental Sciences and the Faculty of Business. Although it is administered in the Faculty of Agricultural, Life and Environmental Sciences, the program is managed by an interdisciplinary committee with representation from both Faculties.

See BSc in Agricultural/Food Business Management for admission information and recommended courses in the first year of studies.

Students are provided with the analytical, scientific and educational foundation on which to build the business and technical components of their field. Students in both majors take courses in business including accounting, finance, marketing and human resources. Each student in the program is expected, through a Capstone course, to integrate knowledge from the agricultural or food sciences with the business management disciplines.

### Requirements of the BSc in Agricultural/Food Business Management Program (★99)

- ★6 ENGL
- ALES 204 - Communication Fundamentals for Professionals
- SMO 301 - Behavior in Organizations
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- STAT 151 - Introduction to Applied Statistics I
- ★3 BIOL or CHEM (see Note 1)
- ACCTG 311 - Introduction to Accounting for Financial Performance
- ACCTG 322 - Introduction to Accounting for Management Decision Making
- AREC 200 - Current Economic Issues for Agriculture and Food
- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- AREC 313 - Statistical Analysis
- AREC 473 - Food and Agricultural Policies
- AREC 484 - Strategic Management in Food and Resource Businesses
- AREC 433 - Financial Management in Resource Industries **OR**
- AREC 482 - Cooperatives and Alternative Business Institutions
- ECON 281 - Intermediate Microeconomic Theory I
- ECON 282 - Intermediate Macroeconomic Theory I
- FIN 301 - Introduction to Finance
- MARK 301 - Introduction to Marketing
- MATH 114 - Elementary Calculus I
- ★21 Approved Program Electives [see Approved Program Electives and Note 2]
- ★12 Free Electives
- ★3 Capstone Course [see Capstone Courses, the note under each major below, and Note 3]

#### Notes

1. Food Business Management majors are required to take BIOL 107 or BIOL 108.
2. Approved Program Electives include ALES electives offered by the Faculty of Agricultural, Life and Environmental Sciences, and BUS electives offered by the Faculty of Business.
3. See Degrees Offered for program planning and structure details.

## Agricultural Business Management Major

This major develops graduates with the abilities required of business professionals working within the agri-food industry. Graduates develop an appreciation of the importance of both scientific and economic relationships involved in agriculture. Graduates also fully understand and appreciate the business management skills needed to manage organizations effectively and efficiently within this sector.

Students choosing Agricultural Business Management are challenged with courses in agricultural business management, as well as courses in agricultural science, including animal, plant and soil sciences. Graduates of this major are

well prepared for a management career in the agri-food industry. Graduates qualify to apply to be Articling Agrologists which can lead to status as Professional Agrologists.

### Requirements of the Major (★21)

- ★6 Approved Program Electives
- AREC 333 - Economics of Production and Resource Management
- AREC 384 - Food Market Analysis
- AN SC 200 - Principles of Animal Agriculture
- PL SC 221 - Introduction to Plant Science
- SOILS 210

**Note:** The capstone course for this major is AREC 423.

## Food Business Management Major

Graduates of this major will develop the abilities required of business professionals working within the food processing and retailing sectors. Graduates develop an understanding of the scientific and economic relationships that influence activities in the food industry. Graduates fully understand and appreciate the business management skills needed to manage organizations effectively and efficiently within this industry.

Students complete courses in food chemistry, engineering and microbiology. This provides a solid scientific background that is combined with food business management and economics courses. Graduates are well positioned for management careers in the food processing and retailing industry.

### Requirements of the Major (★21)

- AREC 384 - Food Market Analysis **OR**
- AREC 333 - Economics of Production and Resource Management
- CHEM 164 - Organic Chemistry I **OR**
- CHEM 261 - Organic Chemistry I
- **AND**
- CHEM 263 - Organic Chemistry II (see Note 1)
- NU FS 100 - Introduction to Food Science and Technology (see Note 2)
- NU FS 363 - Food Microbiology (see Note 2)
- NU FS 373 - Food Chemistry (see Note 2)
- NU FS 374 - Food Fundamentals and Quality (see Note 2)

#### Notes

1. Students who are ineligible to take CHEM 164 are required to take CHEM 261. CHEM 101 is a prerequisite for CHEM 261 and is counted as an APE in the program requirements for students who require it (see General Information).
2. Students who take NU FS 373 in the first year of the program should select an Approved Program Elective in place of NU FS 100.
3. The capstone course for this major is one of AREC 423 or NU FS 450.

## Cooperative Education Program

See Cooperative Education Program.

## BSc in Agriculture

### General Information

The Faculty offers courses leading to the degree of Bachelor of Science in Agriculture. The program provides students with an understanding of the scientific principles underlying the many facets of agriculture together with their application in agricultural systems and related industries. Through a broadly based educational experience, students develop capacities for critical and independent thought and clear expression of ideas. Throughout the program, emphasis is placed on integrating several areas in the physical, biological, and social sciences relevant to modern agricultural practices.

Graduates will have a background in basic social, natural, and agricultural sciences, with an emphasis on sustainable production, renewable agricultural resource management, and economic analysis. Graduates qualify to apply to be Articling Agrologists which can lead to status as Professional Agrologists.

During their first year, or before they register for their second year, students should consult an Academic Advisor. Course choices may affect scheduling for majors.

### Requirements of the BSc in Agriculture Program Core (★39)

- ★3 ENGL
- ALES 204 - Communication Fundamentals for Professionals
- ECON 101 - Introduction to Microeconomics
- STAT 151 - Introduction to Applied Statistics I
- AREC 200 - Current Economic Issues for Agriculture and Food
- AN SC 200 - Principles of Animal Agriculture
- MATH 114 - Elementary Calculus I
- PL SC 221 - Introduction to Plant Science
- REN R 210 - Introduction to Soil Science and Soil Resources
- ★6 Free Electives
- ★3 Capstone Course [see note under each major as well as Capstone Courses]

#### ★3 from

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology (see Note)

**Note:** BIOL 108 and BIOL 208 are required for the Sustainable Agricultural Systems and Animal Science Majors, and the Pre-Veterinary Medicine Program.

## Agricultural and Resource Economics Major

### General Information

This major provides students with an understanding of the basic principles of economics and develops a scientific background sufficient to apply economic tools to production, processing, marketing, and financing and consumption in the agri-food and other resource industries. Students will gain expertise in the use of economic theory in agricultural and other natural resource industries, and will develop analytical techniques that permit them to understand and assess a wide variety of policy and market issues. The program develops knowledge of applied social, agricultural, and natural sciences that permits graduates to succeed in a variety of agricultural and natural resource settings.

### Requirements of the Major (★81)

- ACCTG 300 - Introduction to Accounting
- ★6 from 400-level AREC
- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- AREC 313 - Statistical Analysis
- AREC 333 - Economics of Production and Resource Management
- AREC 384 - Food Market Analysis
- AREC 473 - Food and Agricultural Policies
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- AREC 365 - Natural Resource Economics
- AREC 430 - Economic Impact Assessment **OR**
- AREC 433 - Financial Management in Resource Industries
- ECON 102 - Introduction to Macroeconomics
- ECON 281 - Intermediate Microeconomic Theory I
- ECON 282 - Intermediate Macroeconomic Theory I
- ENCS 473 - Environmental and Conservation Policy **OR**
- FOREC 473 - Forest Policy
- ★3 ENGL
- ★24 Approved Program Electives [see Approved Program Electives]
- ★6 Free Electives

#### ★3 from

- REN R 432 **OR**
- R SOC

**Note:** The capstone course for this major is one of AREC 410 or AREC 423.

## Animal Science Major

### General Information

The Animal Science Major encompasses studies of livestock, including dairy, swine, beef, poultry and diversified livestock.

This major enables students to gain an understanding of the scientific disciplines of animal science including physiology, genetics, biochemistry, nutrition, and behavior. Students will also learn how to integrate and apply these concepts to solve problems in animal production systems.

Graduates with this major find opportunities in a wide range of agribusiness industries, government agencies and primary agriculture.

### Requirements of the Major (★81)

- AN SC 260 - Fundamentals of Animal Nutrition **OR**
- ★3 NUTR
- AN SC 310 - Physiology of Domestic Animals
- AN SC 311 - Metabolic Physiology of Domestic Animals
- AN SC 312 - Reproductive Physiology of Domestic Animals
- AN SC 484 - Animal Molecular Biology **OR**
- AN SC 485 - Animal Genetic Improvement
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- ★6 from Organic Chemistry, Inorganic Chemistry, or Physics
- ECON 102 - Introduction to Macroeconomics
- ★27 Approved Program Electives [see Approved Program Electives]
- ★6 Free Electives

#### ★6 from

- AN SC 461 - Ruminant Digestion, Metabolism, and Nutrition
- AN SC 462 - Swine Nutrition
- AN SC 463 - Poultry Nutrition

#### ★6 from

- AN SC 471 - Applied Poultry Science
- AN SC 472 - Applied Dairy Production Science
- AN SC 474 - Applied Beef Cattle Science
- AN SC 476 - Applied Swine Science

#### ★9 from

- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology

**Note:** The capstone course for this major is AN SC 479.

## Crop Science Major

### General Information

This major focuses on the agronomy and science of agricultural crop production. It provides students with an in-depth understanding of plant growth, soils and factors affecting crop production. Crop responses to a range of environmental factors are addressed. Students learn about biotechnological, breeding and production management techniques used to develop, grow and market well-adapted, high quality and high yielding crop cultivars. Students also develop skills to respond to economic situations, market demands, environmental constraints and societal expectations.

Graduates with this major are able to work and serve in technical, sales and management positions with agri-business industries, in advisory, regulatory and management positions with government agencies, or in primary production.

### Requirements of the Major (★81)

- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and

- Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- 
- BOT 340 - Plant Physiology
- ECON 102 - Introduction to Macroeconomics
- 
- ENCS 356 - Principles of Rangeland Conservation and Habitat Management **OR**
- PL SC 354 - Forage Crops
- 
- ★3 ENGL
- ★6 from Organic Chemistry, Inorganic Chemistry, or Physics
- PL SC 324 - Crop Ecophysiology
- PL SC 355 - Cereal, Oilseed, and Pulse Crops
- PL SC 495 - Integrated Crop Protection
- 
- PL SC 365 - Genetic Improvement of Crop Plants **OR**
- REN R 445 - Soil Fertility
- 
- ★27 Approved Program Electives (see Approved Program Electives)
- ★6 Free Electives

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#### ★6 from

- (not taken in core)
- BIOL 107 - Introduction to Cell Biology
- BIOL 108 - Introduction to Biological Diversity
- BIOL 207 - Molecular Genetics and Heredity
- BIOL 208 - Principles of Ecology
- BIOCH 200 - Introductory Biochemistry
- BIOCH 310 - Bioenergetics and Metabolism
- EAS 100 - Planet Earth
- EAS 105 - The Dynamic Earth Through Time
- PL SC 331

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#### ★6 from

- ENT 222 - Insects in Managed Ecosystems
- PL SC 352 - Invasive Alien Plants: Biology and Control
- PL SC 380 - Principles of Plant Pathology

**Note:** The capstone course for this major is PL SC 499.

## Range and Pasture Management Major

(Effective Fall 2012, applications to this major are no longer accepted. Interested students should consider applying to the BSc Environmental and Conservation Sciences, Wildlife and Rangeland Resources Management major.)

Students currently enrolled in the BSc Agriculture Range and Pasture Management major will be allowed to finish their degree program no later than 2017-2018..

## Sustainable Agricultural Systems Major

### General Information

Knowledge about individual components of agricultural systems (including people, plants, animals and soil, water and other resources) has expanded rapidly, but less is known about how these systems work as a whole. There is a need to integrate knowledge from a number of disciplines in order to maintain and enhance the performance of agricultural systems so that resource use is efficient and sustainable. Agricultural systems can be viewed from a local, national or international perspective. A systems approach to sustainable agriculture considers the linkages between human activity and institutions with agricultural production systems. Key areas of study include agricultural production systems, natural resource management and the interrelationships of these with social and economic systems.

Graduates are prepared for careers in agriculture and systems analysis within government or the agriculture and food industry.

### Requirements of the Major (★81)

- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- 
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**

- SMO 301 - Behavior in Organizations
- 
- AREC 365 - Natural Resource Economics
- 
- EAS 221 - Introduction to Geographical Information Systems and Remote Sensing **OR**
- REN R 201 - Introduction to Geomatic Techniques in Natural Resource Management
- 
- ECON 102 - Introduction to Macroeconomics
- ★3 ENGL or WRS
- REN R 350 - Physical Hydrology
- REN R 441 - Soil Formation and Landscape Processes
- REN R 446 - Climates and Ecosystems
- REN R 450 - Environmentally Sustainable Agriculture
- R SOC 355 - Rural Communities and Global Economies
- ★27 Approved Program Electives [see Approved Program Electives]
- ★6 Free Electives

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#### ★3 from

- AREC 333 - Economics of Production and Resource Management
- AREC 384 - Food Market Analysis
- AREC 473 - Food and Agricultural Policies

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#### ★6 from

- BIOCH 200 - Introductory Biochemistry **OR**
- PL SC 331
- 
- BIOL 107 - Introduction to Cell Biology
- BIOL 207 - Molecular Genetics and Heredity
- EAS 100 - Planet Earth
- EAS 105 - The Dynamic Earth Through Time
- Organic Chemistry
- Inorganic Chemistry
- PHYS

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#### ★6 from

- AN SC 471 - Applied Poultry Science
- AN SC 472 - Applied Dairy Production Science
- AN SC 474 - Applied Beef Cattle Science
- AN SC 476 - Applied Swine Science
- ENCS 356 - Principles of Rangeland Conservation and Habitat Management
- PL SC 354 - Forage Crops
- PL SC 355 - Cereal, Oilseed, and Pulse Crops

**Note:** The capstone course for this major is one of

- AN SC 471 - Applied Poultry Science **OR**
- AN SC 472 - Applied Dairy Production Science **OR**
- AN SC 474 - Applied Beef Cattle Science **OR**
- AN SC 476 - Applied Swine Science
- 
- ENCS 471 - Practical Case Studies in Rangeland Management and Conservation
- PL SC 499 - Cropping Systems

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## BSc in Animal Health

### General Information

The BSc Animal Health program provides a strong background in basic life sciences with application in animal immunology and infection, animal physiology, nutrition, behavior and welfare, animal production and food processing. It is of value to students with an interest in the food animal production industry or in the field of companion animals. Experiential learning is a substantial component of this program.

The competitiveness of animal agriculture in western Canada depends on refinement and continued adaptation of production systems that respond to public sensitivities related to animal welfare and the safety of the food supply. Three majors within this degree (Companion and Performance Animals, Food Animals and Food Safety and Quality) will provide students with enrichment to match their interest and career goals. Graduates of the program will be well positioned for careers in the companion and performance animal industries or

in the food-production value chain, from primary livestock and poultry production, through to product safety and quality.

During their first year, or before they register for their second year, students should consult an Academic Advisor. Course choices may affect scheduling for majors.

While registered in the BSc Animal Health program students may complete the requirements for Pre-Veterinary Medicine (Pre-Veterinary Medicine) in order to be eligible to apply for admittance to Doctor of Veterinary Medicine (DVM) programs at either the University of Saskatchewan's Western College of Veterinary Medicine or the University of Calgary's Faculty of Veterinary Medicine.

#### Requirements of the program (★72)

- ALES 204 - Communication Fundamentals for Professionals
  - AN SC 100 - Introduction to Animal Health Science
  - AN SC 376 - Animal Welfare
  - 
  - AREC 200 - Current Economic Issues for Agriculture and Food **OR**
  - AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses
  - 
  - BIOCH 200 - Introductory Biochemistry
  - BIOL 107 - Introduction to Cell Biology
  - BIOL 108 - Introduction to Biological Diversity
  - BIOL 207 - Molecular Genetics and Heredity
  - BIOL 208 - Principles of Ecology
  - CHEM 101 - Introductory University Chemistry I
  - CHEM 102 - Introductory University Chemistry II
  - CHEM 261 - Organic Chemistry I
  - ECON 101 - Introduction to Microeconomics
  - ECON 102 - Introduction to Macroeconomics
  - ★3 ENGL
  - IMIN 200 - Infection and Immunity
  - ★3 MATH
  - MICRB 265 - General Microbiology
  - STAT 151 - Introduction to Applied Statistics I
  - ★9 Free Electives
  - ★3 Capstone [see Note and Capstone Courses]
- 
- ★3 from**
- AN SC 411 - Veterinary Immunology
  - AFNS 416 - One Health
  - BIOL 409 - Zoonoses

**Note:** The capstone course for this program is AN SC 499.

## Companion and Performance Animals Major

### General Information:

This unique major recognizes that companion animals, including horses, are playing an increasingly significant role in society. Many of these species are trained for search and rescue, narcotics detection, and as service animals to provide greater independence for the physically challenged. Sports that involve companion animals continue to increase in popularity and new roles for companion animals include animal assisted therapy or animal assisted activities to improving the well-being of individuals. In this major, students will develop an understanding of the physiology, nutrition, and behaviour of these animals, the evolving role of companion animals, and the sociology/psychology of the human-animal bond. Students will also have the opportunity to engage in research involving human-animal interactions. Graduates from this major will be well prepared for application to DVM programs if their interest is in companion animal medicine (including equine medicine) and postgraduate programs focusing on the role of companion animals in society. Graduates will also be prepared for employment in the many industries that support companion and performance animals.

#### Requirements of the major (★48)

- AN SC 110 - Introduction to Equine Science
- AN SC 120 - Companion Animals and Society
- AN SC 260 - Fundamentals of Animal Nutrition
- AN SC 310 - Physiology of Domestic Animals
- AN SC 311 - Metabolic Physiology of Domestic Animals
- AN SC 312 - Reproductive Physiology of Domestic Animals
- AN SC 378 - Companion Animal Behaviour

- AN SC 464 - Companion Animal Nutrition
- AN SC 496 - Research on the Human Animal Bond
- PSYCO 104 - Basic Psychological Processes
- ★18 Approved Program Electives [see Approved Program Electives]

## Food Animals Major

### General Information:

This major offers students enrichment in animal health in the livestock and poultry industries. Coursework focuses on a sound knowledge of how the animal agriculture and food industries interface, through an understanding of animal and human disease, animal nutrition, microbiology, physiology, behaviour and production. Students will work closely with agricultural animals and have many opportunities for industry interaction. Graduates with an interest in food animals will gain a solid foundation to proceed to a DVM degree. Other career opportunities could include the animal pharmaceutical industry, the livestock production industry (nutrition, farm animal welfare, livestock production regulation), and employment in the food safety and quality area. Students will also be well prepared to pursue graduate studies in livestock, biological sciences, or food safety.

#### Requirements of the major (★48)

- AN SC 200 - Principles of Animal Agriculture
- AN SC 260 - Fundamentals of Animal Nutrition
- AN SC 310 - Physiology of Domestic Animals
- AN SC 311 - Metabolic Physiology of Domestic Animals
- AN SC 312 - Reproductive Physiology of Domestic Animals
- AN SC 377 - Food Animal Behaviour
- NU FS 100 - Introduction to Food Science and Technology
- NU FS 363 - Food Microbiology
- ★15 Approved Program Electives [see Approved Program Electives]

#### ★3 from

- AN SC 461 - Ruminant Digestion, Metabolism, and Nutrition
- AN SC 462 - Swine Nutrition
- AN SC 463 - Poultry Nutrition

#### ★6 from

- AN SC 471 - Applied Poultry Science
- AN SC 472 - Applied Dairy Production Science
- AN SC 474 - Applied Beef Cattle Science
- AN SC 476 - Applied Swine Science

## Food Safety and Quality Major

### General Information:

This major builds upon the interface between food animal health and food production, and is especially focussed on the food processing industries. The required coursework covers animal production nutrition and physiology, and has a large focus on animal product processing, food quality and safety. Graduates of this major are well prepared for DVM programs, as well as food safety and quality related employment in the rapidly growing food industry. Graduates are in high demand due to increased emphasis on on-farm food safety and quality assurance programs, as well as the design and implementation of HACCP (Hazard Analysis Critical Control Point) plans.

#### Requirements of the major (★48)

- AN SC 200 - Principles of Animal Agriculture
- NU FS 100 - Introduction to Food Science and Technology
- NU FS 312 - Quality Assurance
- NU FS 361 - Food Microbiology
- NU FS 427 - Food Safety
- NU FS 480 - Foodborne Pathogens
- IMIN 324 - Basic Virology
- ★15 Approved Program Electives [see Free Electives]

#### ★3 from

- AN SC 471 - Applied Poultry Science
- AN SC 472 - Applied Dairy Production Science
- AN SC 474 - Applied Beef Cattle Science
- AN SC 476 - Applied Swine Science

**★9 from**

- AN SC 320 - Livestock Growth and Meat Production
- AN SC 322
- AN SC 420 - Carcass and Meat Quality
- NU FS 403 - Processing of Milk and Dairy Products
- NU FS 404 - Muscle Food Science and Technology

## BSc in Environmental and Conservation Sciences

### General Information

The BSc in Environmental and Conservation Sciences program is for students interested in the natural world, its management, conservation and ecological perspectives. Graduates have a strong background in basic and applied sciences. They are able to evaluate effects of human land use on plant, soil, water, animal, and human resources and to assess and facilitate conservation, reclamation and remediation measures for natural, managed and damaged ecosystems. They are not only reactive but also agents for positive, responsible stewardship and change.

Graduates understand the role that social, economic, and political forces play in natural resource management. They integrate knowledge from various disciplines and are cognizant of the various philosophies about the role of humans in the environment. They are able to employ balanced judgment based on a foundation of environmental ethics and philosophy, and suggest appropriate use of natural resources.

The BSc in Environmental and Conservation Sciences emphasizes integrating natural science, management, and social science as related to environmental issues. It offers a program of study emphasizing applied problem solving and environmental management.

Employment opportunities include career paths with government or non-government agencies (such as private corporations and private consulting) concerned with forestry, parks, nature reserves, nature centres, environmental education, recreational areas, wildlife management, environmental policy analysis, rangeland management, land reclamation, environmental sociology, ecotourism, environmental planning, environmental assessment and environmental management. Students are also well prepared for entry into graduate studies.

With appropriate course selection, graduates may qualify for Professional Agrologist or Professional Biologist designations. Students are advised to select their courses in consultation with an academic advisor early in their program to be sure they can meet these professional organization requirements.

The BSc in Environmental and Conservation Sciences program requires coursework in basic sciences, environmental sciences, resource assessment, environmental philosophy, environmental policy, and natural resource/environmental economics. Students must choose a major by their second year of study. Students should consult with Student Services (2-06 Agriculture-Forestry Centre) about selection of Approved Program Electives..

### Requirements of the BSc in Environmental and Conservation Sciences Program Core (★69)

- ★6 ENGL **OR**
- ★3 ENGL **AND**
- ALES 204 - Communication Fundamentals for Professionals **OR** WRS
- AREC 365 - Natural Resource Economics
- ECON 101 - Introduction to Microeconomics
- STAT 151 - Introduction to Applied Statistics I
- BIOL 108 - Introduction to Biological Diversity
- BIOL 208 - Principles of Ecology
- CHEM 101 - Introductory University Chemistry I
- REN R 110 - Natural Resource Measurement
- REN R 201 - Introduction to Geomatic Techniques in Natural Resource Management
- REN R 210 - Introduction to Soil Science and Soil Resources
- REN R 205 - Wildlife Biodiversity and Ecology
- REN R 260 - History and Fundamentals of Environmental Protection and Conservation
- REN R 307 - Environmental Assessment Principles and Methods

- REN R 350 - Physical Hydrology
- REN R 299 - Environmental and Conservation Sciences and Forestry Field School (See Note 1)
- MATH 114 - Elementary Calculus I
- R SOC 375 - Public Participation and Conflict Resolution
- ENCS 473 - Environmental and Conservation Policy
- PL SC 221 - Introduction to Plant Science
- ★9 Free Electives [see Free Electives and Note]

**Notes**

1. REN R 299 is a spring course normally taken between second and third year.
2. See Degrees Offered for program planning and structure details.
3. All majors in the ENCS program have a minimum ★3 capstone. See specific majors for more details..

## Conservation Biology Major

This major builds the foundation in ecological sciences and natural resource management required to understand conservation priorities for both protected areas and lands managed for multiple values. Students are exposed to the competing demands on natural environments and the challenges in developing integrative approaches towards wildlife and habitat conservation. The program places an emphasis on understanding, planning, and managing the complex ecological relationships of natural environments and strategies aimed at securing their biological integrity and sustainability. Graduates are prepared for careers with government and nongovernment agencies concerned with land management and wildlife and fisheries issues on managed lands or protected areas, as well as advanced degrees in the fields of wildlife ecology and conservation. Employment opportunities also exist with industry and consulting firms.

### Requirements of the Major (★51)

- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- REN R 120 - Introduction to Plant Identification
- REN R 322 - Forest Ecosystems
- REN R 364 - Principles of Managing Natural Diversity
- REN R 376 - Fisheries and Wildlife Management
- REN R 464 - Conservation and Management of Endangered Species
- REN R 366 - Restoration Ecology **OR**
- REN R 440 - Disturbance Ecology Fundamentals
- REN R 462 - Parks, Ecology, and Society **OR**
- REN R 476 - Advanced Fisheries and Wildlife Management
- ★3 Capstone Course [REN R 496]
- ★21 Approved Program Electives [see Approved Program Electives]

**★3 from**

- REN R 468 - Conservation of Genetic Resources
- REN R 469 - Biodiversity Analysis
- REN R 480 - Experimental Design and Data Analysis in the Environmental Sciences

## Environmental Economics and Policy Major

Graduates choosing this major develop skills in the economic analysis of environmental problems and the policy process associated with environmental issues. The interaction among economic, social, political, and legal elements of environmental problems is addressed. The Environmental Economics and Policy major builds on the Environmental and Conservation Sciences Core with a block of courses intended to provide the background for economic, social, and legal approaches to environmental problems and to build quantitative and analytical skills. Extensions into advanced economic theory, political theory, social theory, and other policy sciences are selected from groups of Approved Program Electives.

Graduates are prepared for careers in government and private industry in environmental economic analysis, policy analysis, and other related areas.

### Requirements of the Major (★51)

- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- AREC 313 - Statistical Analysis
- AREC 465 - Advanced Natural Resource Economics

- ECON 102 - Introduction to Macroeconomics
- ECON 281 - Intermediate Microeconomic Theory I
- ECON 282 - Intermediate Macroeconomic Theory I
- ENCS 352 - Natural Resource and Environmental Law
- ECON 269 - Economics of the Environment (see Note)
- R SOC 355 - Rural Communities and Global Economies
- ★6 Capstone Course [AREC 410]
- ★18 Approved Program Electives [Approved Program Electives]

**Note:** For students in BSc Environmental and Conservation Sciences - Bilingual, ECONE 369 is taken and an Approved Program elective is given in its place.

## Human Dimensions of Environmental Management Major

Students in this major will learn about the role of collective action, institutions, policy, and management approaches to address environmental and natural resource issues. A firm foundation in the natural sciences allows students to understand the complexities of environmental change and then focus on the social context and organization through which environmental problems are addressed. Students will take a variety of courses that will prepare them to work in the areas of natural resource management, parks planning, management and interpretation, public outreach for environmental and parks policies and programs, and in other settings as liaisons between members of the public and resource management agencies. See Environmental and Conservation Sciences/ Native Studies Combined Degrees-Human Dimensions of Environmental Management Major, BSc/BA for information on the BSc in Environmental and Conservation Sciences/BA in Native Studies combined degrees with the Human Dimensions of Environmental Management major.

### Requirements of the Major (★51)

- AREC 173 - The Plate, the Planet and Society
- ENCS 352 - Natural Resource and Environmental Law
- R SOC 355 - Rural Communities and Global Economies
- R SOC 365 - Sociology of Environment and Development
- R SOC 450 - Environmental Sociology
- R SOC 271 - The Politics of Food and Natural Resources
- SOC 291 - Introduction to Environmental Sociology
- SOC 315 - Introduction to Social Methodology
- ★6 Capstone Course [R SOC 410]
- ★15 Approved Program Electives [see Free Electives]

#### ★6 from

- R SOC 430
- R SOC 443 - Resilience and Global Change
- R SOC 460 - Perspectives on Traditional Knowledge

## Land Reclamation Major

This major combines the natural and applied sciences to understand, assess, and minimize the impacts of anthropogenic activities on natural resources, with emphasis on soil, plant and water components of the ecosystem. The program emphasizes understanding, planning, rebuilding and managing the complex ecological relationships of natural and anthropogenically disturbed environments. Graduates will be able to conduct and/or direct remediation, soil reclamation, revegetation and conservation measures to maintain quality environments and to reclaim disturbed and damaged ecosystems.

Graduates are prepared for careers in organizations and deal with a broad range of issues related to soil and water pollution and contamination, land reclamation, revegetation, remediation and soil and water conservation. Graduates will contribute natural science expertise to environmental assessments and land-use planning.

### Requirements of the Major (★51)

- CHEM 261 - Organic Chemistry I **OR**
- CHEM 164 - Organic Chemistry I
- 
- REN R 120 - Introduction to Plant Identification
- REN R 441 - Soil Formation and Landscape Processes
- REN R 482 - Soil Remediation
- REN R 483 - Waste Management and Utilization
- ★6 Capstone Course [REN R 495]
- ★15 Approved Program Electives [see Approved Program Electives]

#### ★3 from

- REN R 442 - Soil Biogeochemistry
- REN R 443 - Soil Physics
- REN R 444 - Environmental Soil Chemistry
- REN R 445 - Soil Fertility

#### ★3 from

- BOT 332 - Plant Ecology
- ENCS 406 - Rangeland Plant Communities of Western Canada
- ENCS 407 - Rangeland Plant Communities of North America
- REN R 327 - The Mosses of Alberta: Conservation and Identification
- PL SC 352 - Invasive Alien Plants: Biology and Control

#### ★6 from

- BOT 322 - Field Botany
- ENCS 406 - Rangeland Plant Communities of Western Canada
- ENCS 407 - Rangeland Plant Communities of North America
- REN R 321 - Tree Physiology
- REN R 327 - The Mosses of Alberta: Conservation and Identification
- REN R 442 - Soil Biogeochemistry
- REN R 443 - Soil Physics
- REN R 444 - Environmental Soil Chemistry
- REN R 445 - Soil Fertility
- PL SC 352 - Invasive Alien Plants: Biology and Control

#### ★3 from

- REN R 327 - The Mosses of Alberta: Conservation and Identification
- REN R 366 - Restoration Ecology
- REN R 440 - Disturbance Ecology Fundamentals
- REN R 442 - Soil Biogeochemistry
- REN R 443 - Soil Physics
- REN R 444 - Environmental Soil Chemistry
- REN R 445 - Soil Fertility
- ENCS 406 - Rangeland Plant Communities of Western Canada
- ENCS 407 - Rangeland Plant Communities of North America
- PL SC 352 - Invasive Alien Plants: Biology and Control

## Northern Systems Major

Canada's North is experiencing unprecedented rates of change in environmental, social, and economic conditions. This major is offered in partnership with Yukon College, and primarily delivered in Whitehorse, Yukon. The program applies a systems perspective to understanding the implications of rapid change affecting the North, and developing responses that promote resilience and adaptation. Strong foundations in natural and social sciences provide a platform for exploring approaches to conservation and sustainability in northern regions. Students will experience a learning environment respectful of the area's ecological, cultural and socio-economic realities. Graduates are prepared for careers in federal, territorial and First Nations governments, with resource industries, conservation organizations, and consulting companies operating in the North, and in environmental education and outreach.

### Requirements of the Major (★51)

- NS 200 - Aboriginal Canada: Looking Forward/Looking Back
- NS 390 - Research Methods in Native Studies
- NS 435 - Management of Aboriginal Natural Resources
- REN R 364 - Principles of Managing Natural Diversity
- REN R 365 - Ecology of Northern Landscapes
- REN R 376 - Fisheries and Wildlife Management
- REN R 463 - Biological Adaptations to Northern Environments
- REN R 466 - Climate Change and the North
- REN R 473 - Northern Resource Management
- REN R 480 - Experimental Design and Data Analysis in the Environmental Sciences
- ★3 Capstone Course [REN R 491]
- ★18 Approved Program Electives [see Approved Program Electives]

## Wildlife and Rangeland Resources Management Major

The Wildlife and Rangeland Resources Management major introduces the theory and practice of sustainably managing soil-plant-animal relationships on both private and public lands. Students will gain an understanding of important multiple use issues, including the integration of cattle grazing and wildlife

management with intensive agriculture, forestry, recreational activities and other forms of natural resource use. This major examines the means to increase both the productivity and sustainable use of wild plants and animals within an ecosystem management framework.

Graduates are prepared for careers with government agencies, agricultural conservation associations, agri-businesses or other private firms dealing with management of wildlife and rangeland resources.

### Requirements of the Major (★51)

- ENCS 356 - Principles of Rangeland Conservation and Habitat Management
- ENCS 406 - Rangeland Plant Communities of Western Canada
- REN R 120 - Introduction to Plant Identification
- REN R 376 - Fisheries and Wildlife Management
- REN R 474 - Utilization of Wildlife Resources
- 
- REN R 441 - Soil Formation and Landscape Processes **OR**
- REN R 445 - Soil Fertility
- 
- PL SC 352 - Invasive Alien Plants: Biology and Control
- PL SC 354 - Forage Crops
- 
- REN R 340 - Wildland Fire Science and Management **OR**
- REN R 440 - Disturbance Ecology Fundamentals
- 
- AREC 333 - Economics of Production and Resource Management **OR**
- R SOC 355 - Rural Communities and Global Economies
- 
- ★18 Approved Program Electives [see Approved Program Electives ]

#### ★3 Capstone Course

- AN SC 474 - Applied Beef Cattle Science
- ENCS 471 - Practical Case Studies in Rangeland Management and Conservation **OR**
- REN R 496 - Conservation Planning

## BSc in Forest Business Management

### General Information

This program develops graduates with the abilities required of foresters and of business professionals. Graduates appreciate the need to manage forested areas with due concern for all resources and be capable of managing forested areas as integrated ecological entities. Graduates also fully understand and appreciate the business management skills needed to manage organizations effectively and efficiently within the forest industry.

The Forest Business Management degree is intended to prepare students for careers as professional foresters and is for individuals planning careers focusing on forest practices, but who also demand specialized knowledge in business management practices. The Forest Business Management program prepares students for careers as Registered Professional Foresters. Graduates may immediately apply to the Alberta Registered Professional Foresters Association to complete the registration process.

The program is offered jointly by the Faculty of Agricultural, Life and Environmental Sciences and the Faculty of Business. Although it is administered in the Faculty of Agricultural, Life and Environmental Sciences, the program is managed by an interdisciplinary committee with representation from both Faculties. See BSc in Forest Business Management for admission and recommended courses in the first year of studies.

Students in the BSc in Forest Business Management program are provided with the analytical, scientific, and broad educational foundations on which to build the business and forestry components of their field. The forestry component includes courses in areas such as ecology, engineering, and conservation.

The program includes two field schools (FOR 101 and REN R 299) that provide training in technical aspects of forestry. FOR 101 should be taken in the first year (or in the initial year in the BSc in Forest Business Management program) just before the start of regular classes. REN R 299 is normally taken in the spring between second and third years. REN R 299 must be taken prior to the fourth year of study, to ensure that students are able to apply the skills learned in their last year in the program.

The business management component of this degree consists of introductory and advanced courses in business, including accounting, finance, marketing, and human resources.

### Requirements of the BSc in Forest Business Management Program Core (★120)

- ★6 ENGL **OR**
- ★3 ENGL **AND**
- ★3 WRS **OR**
- ALES 204 - Communication Fundamentals for Professionals
- 
- ACCTG 311 - Introduction to Accounting for Financial Performance
- ACCTG 322 - Introduction to Accounting for Management Decision Making
- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- BIOL 208 - Principles of Ecology
- 
- CHEM 101 - Introductory University Chemistry I **OR**
- CHEM 164 - Organic Chemistry I
- 
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- ECON 281 - Intermediate Microeconomic Theory I
- FIN 301 - Introduction to Finance
- FOREC 345 - Economics of Forestry
- FOREC 473 - Forest Policy
- MARK 301 - Introduction to Marketing
- MATH 114 - Elementary Calculus I
- 
- MGTSC 312 - Probability and Statistics for Business **OR**
- AREC 313 - Statistical Analysis
- 
- REN R 101 - Introductory Forestry Field School
- REN R 299 - Environmental and Conservation Sciences and Forestry Field School (field school) (See Note 1)
- REN R 110 - Natural Resource Measurement
- REN R 120 - Introduction to Plant Identification
- REN R 201 - Introduction to Geomatic Techniques in Natural Resource Management
- REN R 205 - Wildlife Biodiversity and Ecology
- REN R 210 - Introduction to Soil Science and Soil Resources
- REN R 215 - Forest Measurements
- REN R 321 - Tree Physiology
- REN R 322 - Forest Ecosystems
- REN R 323 - Silviculture
- REN R 340 - Wildland Fire Science and Management
- REN R 350 - Physical Hydrology
- REN R 364 - Principles of Managing Natural Diversity
- REN R 430 - Forest Resources Management
- REN R 447 - Forest Health
- R SOC 375 - Public Participation and Conflict Resolution
- STAT 151 - Introduction to Applied Statistics I
- ★3 Free Electives
- ★6 400-level Approved Program Electives from the Faculty of Business [see Approved Program Electives]
- ★3 Capstone Course [see Capstone Courses and Note 2]

#### ★6 from

- REN R 314 - Forest Soils
- REN R 327 - The Mosses of Alberta: Conservation and Identification
- REN R 335 - Forest Harvesting and Transport
- REN R 345 - Wood Science and Utilization
- REN R 414 - Agroforestry Systems
- REN R 421 - Advanced Tree Physiology
- REN R 423 - Advanced Silviculture
- REN R 426 - Geographical Information Systems Applications in Renewable Resources
- REN R 452 - Forest Watershed Management
- REN R 456
- REN R 522
- REN R 523 - Silvicultural Systems
- REN R 535 - Operations Research for Natural Resource Management
- REN R 545

#### ★3 from

- SMO 301 - Behavior in Organizations
- SMO 311 - HRM: Managing the Work Force in Canada



- SMO 321 - Introduction to Strategic Management and Organization Design

#### Notes

1. REN R 101 (★0) must be taken in the student's first year (or in the student's initial year in the BSc in Forest Business Management program) just before the start of regular classes. REN R 299 (★3) is normally taken in the spring between second and third year, but must be taken before beginning fourth year (see Course Listings for Renewable Resources course descriptions).
2. See Degrees Offered for program planning and structure details. The capstone for this program is either AREC 423 or REN R 431.

## Cooperative Education Program

See Cooperative Education Program.

## BSc in Forestry

### General Information

The Faculty offers courses leading to the degree of BSc in Forestry. The program consists of four years of University study with a yearly course load of ★30, as well as field schools taken just prior to first year, and in the spring between second and third year.

The BSc in Forestry develops graduates who appreciate the need to manage forested areas with due concern for all resources and who have the capability and knowledge to manage forested areas as integrated ecological entities. It focuses primarily on forest management, the protection, manipulation, and use of the forest resource while ensuring that sustainability and other social and cultural needs are met.

The field of forestry embraces topics as diverse as economics, ecology, engineering and conservation. As a consequence, a broad range of career opportunities exist for graduates. The program prepares students for careers as Registered Professional Foresters working in government or industrial organizations or as consultants. To complete the registration process, graduates apply directly to the appropriate Registered Professional Foresters Association.

Field school exercises provide training in technical aspects of forestry, including forest mensuration, engineering, ecology and silviculture. All field schools must be taken prior to the fourth year of study, to ensure that students are able to apply the skills learned in their last year in the program

### Requirements of the BSc in Forestry Program (★120)

- ★6 ENGL **OR**
- ★3 ENGL **AND**
- ★3 WRS **OR**
- ALES 204 - Communication Fundamentals for Professionals
- 
- AREC 214 - Applications of Linear Models to Food, Resources and the Environment
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses
- ECON 101 - Introduction to Microeconomics
- STAT 151 - Introduction to Applied Statistics I
- 
- CHEM 101 - Introductory University Chemistry I **OR**
- CHEM 164 - Organic Chemistry I
- 
- BIOL 208 - Principles of Ecology
- MATH 114 - Elementary Calculus I
- REN R 101 - Introductory Forestry Field School
- REN R 299 - Environmental and Conservation Sciences and Forestry Field School (field school) (see Note 1)
- REN R 110 - Natural Resource Measurement
- REN R 120 - Introduction to Plant Identification
- REN R 201 - Introduction to Geomatic Techniques in Natural Resource Management
- REN R 205 - Wildlife Biodiversity and Ecology
- REN R 210 - Introduction to Soil Science and Soil Resources
- REN R 215 - Forest Measurements
- REN R 260 - History and Fundamentals of Environmental Protection and Conservation

- REN R 321 - Tree Physiology
- REN R 322 - Forest Ecosystems
- REN R 323 - Silviculture
- REN R 340 - Wildland Fire Science and Management
- REN R 350 - Physical Hydrology
- REN R 364 - Principles of Managing Natural Diversity
- REN R 430 - Forest Resources Management
- REN R 447 - Forest Health
- FOREC 345 - Economics of Forestry
- FOREC 473 - Forest Policy
- R SOC 375 - Public Participation and Conflict Resolution
- ★15 Approved Program Electives [see Approved Program Electives]
- ★12 Free Electives
- ★3 Capstone Course [see Note 3 and Capstone Courses]

#### ★6 from

- REN R 314 - Forest Soils
- REN R 327 - The Mosses of Alberta: Conservation and Identification
- REN R 335 - Forest Harvesting and Transport
- REN R 345 - Wood Science and Utilization
- REN R 414 - Agroforestry Systems
- REN R 421 - Advanced Tree Physiology
- REN R 423 - Advanced Silviculture
- REN R 426 - Geographical Information Systems Applications in Renewable Resources
- REN R 452 - Forest Watershed Management
- REN R 456
- REN R 522
- REN R 523 - Silvicultural Systems
- REN R 535 - Operations Research for Natural Resource Management
- REN R 545

#### Notes

1. REN R 101 (★0) must be taken just before the start of regular classes in the first year. REN R 299 (★3) is normally taken in the spring between the second and third year, but must be taken before beginning fourth year (see Course Listings for Renewable Resources course descriptions).
2. The Capstone Course for this program is REN R 431.
3. See Degrees Offered for program planning and structure details.

## BSc in Human Ecology

### General Information

Human Ecology is a multidisciplinary field that uses a holistic approach to solve human problems and to enhance human potential in all environments where people live and work: the social, natural, cultural, political, and material. Completion of ★120 is required. (See Notes 1 and 2).

Students should be aware that under the *Protection for Persons in Care Act*, they may be required to satisfy a criminal records check before being allowed to participate in the required practicum (field placement).

### Requirements of the BSc in Human Ecology Program (★60)

- ★6 ENGL **OR**
- ★3 ENGL **AND** ★3 WRS
- 
- ALES 204 - Communication Fundamentals for Professionals
- 
- AREC 323 - Introduction to Management for Agri-Food, Environmental, and Forestry Businesses **OR**
- SMO 301 - Behavior in Organizations
- 
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- 
- SOC 210 - Introduction to Social Statistics **OR**
- STAT 151 - Introduction to Applied Statistics I (see Note 3)
- 
- HECOL 100 - Introduction to Principles and Practice in Human Ecology
- HECOL 300 - Policy Development and Evaluation
- HECOL 408 - Intentional Professional Practice
- ★6 Capstone Course HECOL 409 (see Degrees Offered Note 6)
- ★6 from Social Science/Humanities (see Note 5)

- ★12 Free Electives

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### ★3 from

- HECOL 465 - Material Culture, Methods and Identities
- MARK 312 - Marketing Research
- PSYCO 212 - Introduction to Research Methods in Psychology
- SOC 315 - Introduction to Social Methodology
- WGS 302 - Feminist Research and Methodologies

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### ★6 Natural Sciences from

- (see Note 4)
- BIOL
- CHEM
- EAS (Faculty of Science)
- PSYCO (Faculty of Science)
- NUTR 100 - Nutrition and Wellbeing
- NU FS 100 - Introduction to Food Science and Technology
- PHYS

### Notes

1. Professional Designation: To meet the educational requirements for Professional Human Ecologist designation, students must present ★36 in Human Ecology, Nutrition and Food Science, or Nutrition, including HECOL 100, plus ★12 in course work closely related to their specialization.
2. A course may be used for credit only once in a program.
3. SOC 210 is recommended for the Family Ecology major.
4. PSYCO 104 is required for the Family Ecology major.
5. SOC 100 and PSYCO 105 are required for Family Ecology major. Social Sciences/Humanities courses are selected from Agricultural and Resource Economics (AREC), any course offered by the Faculty of Arts, Native Studies (NS, except NS 100), Rural Sociology (R SOC), and Theology (CHRTC or CHRTP)..

## Practicum Program

Two courses comprise the Practicum Program in Human Ecology: HECOL 408 and HECOL 409. HECOL 408 must be successfully completed prior to completing HECOL 409.

Students are not permitted to register in Practicum Program courses while on academic warning.

Registration in Practicum Program courses is a two-part process. Students must first complete and submit an application form to the Practicum Coordinator in April prior to the academic year they will take their practicum courses. Students then register in HECOL 408 and HECOL 409.

HECOL 408 is offered in Fall and Winter Terms. Students enrolled in Fall Term must complete HECOL 409 in the immediately following Winter Term. Students enrolled in Winter Term must complete HECOL 409 in the immediately following Spring or Fall Term.

HECOL 409 is offered in Fall, Winter and Spring Term. Not all cooperating employers offer placements in all terms

Students registering in Spring Term HECOL 409 will not be eligible for convocation in June immediately following their practicum.

Because of the intensity of the workload while completing HECOL 409, students must not exceed the ★15 maximum in course registration for that term.

A student who has been assigned a grade of "W" or "NC" in a Practicum Program course is entitled to a second registration in this course. If a student receives a "W" or "NC" in the second attempt of a Practicum Program course, they are normally required to withdraw from the BSc in Human Ecology program.

Any student who has withdrawn from a Practicum Program course must receive the approval of the Practicum Coordinator to reregister in the course.

During their practicum students are expected to conduct themselves according to the AHEA Code of Ethics and the University of Alberta Code of Student Behavior.

Students may only complete HECOL 409 once within their degree.

Practicum Intervention Policy: The Practicum Coordinator, on behalf of the Dean, may immediately deny assignment of a student to, withdraw a student from, or vary terms and conditions of a practicum placement if the Coordinator has reasonable grounds to believe this is necessary in order to protect the public interest. See Practicum Intervention Policy for details.

Accommodation for Persons with Disabilities: The Department of Human Ecology supports the principle of reasonable accommodation. Human Ecology students in need of accommodations during their practicum placement must submit a written request for and formalize a professional practice accommodation plan at the beginning of HECOL 408..

## Family Ecology Major

The Family Ecology major provides students with the opportunity to learn about family strengths, issues, prevention and intervention techniques across the life span. Some areas that will be covered are parent-child relationships, family relations, community diversity, community development, sexuality, family challenges, aging, and family finances. Graduates will work in jobs such as program coordinators, career counselors, family support workers, credit counselors, retirement planners, life skills educators, and community programmers.

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### Requirements of the Major (★57)

- HECOL 210 - Intimate Relationships
- HECOL 211 - Human Sexuality
- 
- HECOL 212 - Later Life Families **OR**
- HECOL 414 - Seniors and Their Environments
- 
- HECOL 301 - Program Planning and Evaluation
- HECOL 310 - Parent-Child Relationships
- HECOL 313 - Family Dynamics
- HECOL 315 - Interviewing and Counseling
- HECOL 321 - Introduction to Family Finance
- HECOL 322 - Family Economic Issues
- HECOL 412 - Family Challenges
- HECOL 413 - Working With Families
- HECOL 440 - Family Policy Issues
- HECOL 443 - Family Law
- PSYCO 223 - Lifespan Developmental Psychology
- SOC 271 - Introduction to the Family
- 
- ★12 Approved Program Electives. To see courses listed in the approved program electives, please go to [ales.ualberta.ca](http://ales.ualberta.ca).

## Clothing, Textiles and Material Culture Major

The major in Clothing, Textiles and Material Culture explores the material world of everyday life, from textiles to home interiors. This multidisciplinary, holistic major examines the theoretical, technical, creative, and applied aspects of the near environment, with a particular focus on clothing and textiles. Through studying the production, design, evaluation, and consumption of items such as fabrics, fashionable garments, museum exhibits, and home interiors, students gain both advanced academic knowledge and relevant practical experience.

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### Requirements of the Major (★57)

- HECOL 170 - Introduction to Textiles
- HECOL 201 - Introduction to Material Culture
- HECOL 241 - Fashion Industries
- HECOL 250 - Design Studies and Practice
- HECOL 254 - Apparel Design and Construction Fundamentals
- HECOL 268 - Survey of Historic Dress in the Western World
- HECOL 270 - Applications of Textile Science
- 
- HECOL 301 - Program Planning and Evaluation **OR**
- MARK 432 - Marketing Communications
- 
- HECOL 333 - Cross-Cultural Textiles
- HECOL 360 - Dress and Culture
- HECOL 370 - Quality Assurance for Textiles and Apparel
- HECOL 441 - Textiles and Apparel in the Global Economy

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### ★9 from

- HECOL 354 - Apparel Design and Product Development I
- HECOL 454 - Apparel Design and Product Development II
- HECOL 460 - Nineteenth, Twentieth, and Twenty-First Century Dress in the Western World
- HECOL 465 - Material Culture, Methods and Identities
- HECOL 469 - Material Culture in Practice
- HECOL 470 - Topics in Advanced Textile and Apparel Science

- HECOL 473 - Clothing and Materials for Sport and Safety
- HECOL 476 - Textile Analysis and Care
- ★12 Approved Program Electives. To see courses listed in the approved program electives, please go to ales.ualberta.ca.
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## BSc in Environmental and Conservation Sciences/BA in Native Studies Combined Degrees—Human Dimensions of Environmental Management Major

### General Information

(See BA in Environmental Studies and BA (Native Studies)/BSc in Environmental and Conservation Sciences Combined Degrees)

The Faculty of Agricultural, Life and Environmental Sciences and the Faculty of Native Studies offer a five-year integrated program of ★150 leading to Bachelor of Science and a Bachelor of Arts degrees. A better academic understanding of the Aboriginal use of resources can prepare students to work effectively in various contexts where knowledge of Aboriginal and Treaty rights and issues is required. The Combined Degrees between Environmental and Conservation Sciences and Native Studies are a means for students to specialize in the management of Aboriginal resources. The major in the Combined Degrees program is Human Dimensions of Environmental Management.

The program is open to both Native and non-Native applicants. Enrolment management procedures of the Faculty of Native Studies and the Faculty of Agricultural, Life and Environmental Sciences will apply for all years of the program.

Students will remain in the Faculty to which they were admitted for the duration of their program..

### Requirements of the BSc in Environmental and Conservation Sciences Program Core (★63)

- (See notes and Program Requirements)
- ★6 ENGL **OR**
- ★3 ENGL **AND**
- ALES 204 - Communication Fundamentals for Professionals **OR** WRS
- 
- AREC 365 - Natural Resource Economics
- BIOL 108 - Introduction to Biological Diversity
- BIOL 208 - Principles of Ecology
- CHEM 101 - Introductory University Chemistry I
- ECON 101 - Introduction to Microeconomics
- MATH 114 - Elementary Calculus I
- PL SC 221 - Introduction to Plant Science
- R SOC 375 - Public Participation and Conflict Resolution
- R SOC 410 - Research Methods and Policy Applications in Applied Environmental Sociology [★6 Capstone Course, (see Capstone Courses)]
- REN R 110 - Natural Resource Measurement
- REN R 350 - Physical Hydrology
- REN R 205 - Wildlife Biodiversity and Ecology
- REN R 260 - History and Fundamentals of Environmental Protection and Conservation
- REN R 307 - Environmental Assessment Principles and Methods
- ENCS 473 - Environmental and Conservation Policy
- REN R 210 - Introduction to Soil Science and Soil Resources
- REN R 299 - Environmental and Conservation Sciences and Forestry Field School (field school) (see Note 4)
- STAT 151 - Introduction to Applied Statistics I
- ★3 Free Elective (see Note 1)

**Note:** The Capstone Course for this major is R SOC 410.

### Requirements of the Human Dimensions in Environmental Management Major (★45)

- AREC 173 - The Plate, the Planet and Society
- ENCS 352 - Natural Resource and Environmental Law
- R SOC 365 - Sociology of Environment and Development
- R SOC 450 - Environmental Sociology
- R SOC 355 - Rural Communities and Global Economies
- R SOC 271 - The Politics of Food and Natural Resources
- SOC 291 - Introduction to Environmental Sociology
- SOC 315 - Introduction to Social Methodology (see Note 3)
- ★15 Approved Program Electives [see Note 1 and Approved Program Electives and Note]

#### ★6 from

- R SOC 460 - Perspectives on Traditional Knowledge

### Requirements of the BA in Native Studies (★42)

- ★3 Fine Arts, junior or senior (see Note 1)
- ★6 Humanities, junior or senior (see Note 1)
- ★3 Social Sciences, junior or senior (see Note 1)
- NS 110 - Historical Perspectives in Native Studies
- NS 111 - Contemporary Perspectives in Native Studies
- NS 290 - Introduction to Research and Inquiry
- NS 390 - Research Methods in Native Studies
- ★6 NS courses at the 200- or 300-level (see Notes 1, 2, and Native Studies Major Cross-listed Courses)
- ★6 NS courses at the 400-level (see Native Studies Major Cross-listed Courses)

#### ★6 from

- NS 152 - Introductory Cree **OR**
- NS 105 **AND**
- NS 153

### Notes

1. No more than ★48 can be taken at the junior (100) level. ★42 junior level is required in the program. As a result, ★6 is the total 100-level allowable from all of the following combined: ★3 Fine Arts, ★3 Social Sciences, ★6 Humanities and the Approved Program Electives. See Faculty Common Requirements for courses that meet Fine Arts, Humanities and Social Science basic requirements.
2. Students with greater than ★24 transfer credit will take NS 200-level or higher (excluding NS 200).
3. The SOC 315 prerequisite (SOC 210) has been waived.
4. REN R 299 is normally taken in the spring between second and third year.
5. See Degrees Offered for program planning and structure details..

## Appeals and Graduation

### Appeals

Students registered in the Combined Degrees can obtain consistent information for formal and informal grade appeal and academic appeal procedures and regulations from both the Faculty of Agricultural, Life and Environmental Sciences, and the Faculty of Native Studies.

### Graduation

Students registered in the BSc (Environmental and Conservation Sciences/BA (Native Studies) Combined Degrees require ★150 to graduate. The GPA and requirements check will be done in consultation with the Faculty of Native Studies. See Academic Standing and Academic Standing.

## BSc in Environmental and Conservation Sciences—Bilingual/Baccalauréat ès sciences (sciences de l'environnement et de la conservation—bilingue)

Effective September 2015, there will be no further admissions to BSc ENCS program. Students who entered the program prior to September 2015 must complete all program requirements by April 30, 2021. The last BSc ENCS program will be granted at Spring Convocation 2021.

### General Information

The four-year Bilingual Bachelor of Science degree in Environmental and Conservation Sciences is a collaborative effort between Faculté Saint-Jean and the Faculty of Agricultural, Life and Environmental Sciences. This program, unique in Canada, offers students the opportunity to obtain a fully bilingual Science degree in Environmental and Conservation Sciences in Canada's two official languages. Students will complete half of their course work in each of the two Faculties.

The program responds to the need to prepare bilingual (French-English) graduates who will evaluate effects of human land use on plant, soil, water, animal and human resources; assess and facilitate conservation, reclamation and remediation measures for natural and damaged ecosystems; understand and communicate in both official languages the role that social, economic and political forces play in natural resource management. This unique degree will be attractive to Francophone and Francophile students across Canada and from other countries.

Career opportunities for BSc Environmental and Conservation Sciences graduates fluent in both of Canada's official languages are many and varied. Employment opportunities include career paths with government or nongovernment agencies (such as private corporations and private consulting companies) concerned with ecotourism, environmental education, environmental management, environmental planning, environmental policy analysis, environmental risk assessment, environmental sociology, forestry, land reclamation, protected areas, nature reserves, parks, rangeland management, recreational areas, resource conservation and wildlife.

Students who have not completed any postsecondary studies will complete ★54 at Faculté Saint-Jean, not counting ★6 for ANGL 101 or equivalent, and ★60 in the Faculty of Agricultural, Life and Environmental Sciences. (see Compétence dans la langue anglaise/English Language Proficiency for Admission)

Transfer students must be fluent in both French and English; fluency criteria will be determined by the Faculties.

Students who have completed one year of postsecondary studies will complete a minimum of ★45 at Faculté Saint-Jean and a minimum of ★45 in the Faculty of Agricultural, Life and Environmental Sciences (see Compétence dans la langue anglaise/English Language Proficiency for Admission).

Students who have completed two or more years of postsecondary studies will complete a minimum of ★30 at Faculté Saint-Jean and a minimum of ★30 in the Faculty of Agricultural, Life and Environmental Sciences (see BSc in Environmental and Sciences Bilingual/Baccalauréate ès sciences (sciences de l'environnement et de la conservation-bilingue) and Transfer Applicants).

Year 1 is primarily taken at Faculté Saint-Jean, and later specialization courses are taken from the Faculty of Agricultural, Life and Environmental Sciences. Courses must be carefully sequenced throughout the four years; therefore, students should plan their programs carefully with help from Advisors from both Faculties.

### Required Courses

See Environmental and Conservation Sciences, BSc including its notes for requirements of the Environmental and Conservation Sciences program core. Students can major in Land Reclamation, Conservation Biology, Human Dimensions of Environmental Management, Environmental Economics and Policy, or Wildlife and Rangeland Resources Management. Requirements of the

individual majors can be found in Conservation Biology Major through Wildlife and Rangeland Resources Management Major.

Students will normally take ★60 at Faculté Saint-Jean (see Le programme/The program for a complete course listing and suggested sequencing).

Students will take the following ★60 offered by the Faculty of Agricultural, Life and Environmental Sciences..

#### Required Courses (★30)

- AREC 365 - Natural Resource Economics
- REN R 205 - Wildlife Biodiversity and Ecology
- REN R 260 - History and Fundamentals of Environmental Protection and Conservation
- REN R 307 - Environmental Assessment Principles and Methods
- ENCS 473 - Environmental and Conservation Policy
- PL SC 221 - Introduction to Plant Science
- REN R 110 - Natural Resource Measurement
- REN R 350 - Physical Hydrology
- REN R 299 - Environmental and Conservation Sciences and Forestry Field School (field school; See Note)
- REN R 210 - Introduction to Soil Science and Soil Resources

#### Major Core Courses

(See Conservation Biology Major through Wildlife and Rangeland Resources Management Major for specific major requirements)

- ★12 - 21 Major Core Courses
- ★6 - 15 Approved Program Electives
- ★3 - 6 Capstone course

**Note:** REN R 299 Field School is normally taken in the spring between second and third years.

### Appeals and Graduation

#### Appeals

Students registered in the bilingual program can obtain consistent information for formal and informal grade appeal and academic appeal procedures and regulations from both the Faculty of Agricultural, Life and Environmental Sciences, and Faculté Saint-Jean.

#### Graduation

Students registered in the BSc Environmental and Conservation Sciences - Bilingual require ★120 to graduate. Eligibility for convocation will be assessed by the Faculty of Agricultural, Life and Environmental Sciences in consultation with Faculté Saint-Jean.

## BSc in Human Ecology/BEEd (Secondary) Combined Degrees

### General Information

(See also Bachelor of Science in Human Ecology/Bachelor of Education (Secondary) Combined Degrees and BSc in Human Ecology/BEEd (Secondary) Combined Degrees [Education])

The Bachelor of Science in Human Ecology/Bachelor of Education (Secondary) Combined Degrees program provides a five-year integrated program of ★150 that prepares graduates for teaching CTS strands such as Foods and Fashion Studies. Coursework within the two Faculties is taken concurrently. Students initially apply for admission to the Faculty of Agricultural, Life and Environmental Sciences and are considered to be registered in that Faculty for the first three years of the program. All qualified Year 3 BSc in Human Ecology/Bachelor of Education students will be promoted to Year 4 in the Faculty of Education provided a minimum GPA of 2.0 has been achieved and a minimum of ★90 applicable to the BSc in Human Ecology/BEEd (Secondary) Degrees program has been successfully completed. See Bachelor of Science in Human Ecology/Bachelor of Education (Secondary) Combined Degrees for detailed admission requirements and procedures for entry to Year 4 of this Combined Degrees Program.

#### Notes

1. Students in Year 3 who have completed less than ★90 toward the BSc in Human Ecology/BEd program, but who have a GPA of at least 2.0, may remain in Year 3 of that program in the Faculty of Agricultural, Life and Environmental Sciences for one additional year.
2. A student who has been assigned a grade of "W" or "NC" in an Education Field Experience course is entitled to a second registration in this course. See also Reregistration in Courses. Notwithstanding Reregistration in Courses, students who receive a "W" or "NC" in the second attempt of a Field Experience course, will be required to withdraw from the combined degrees program, but may transfer back to the BSc in Human Ecology program.
3. The final year of the program will normally be taken in attendance at the University of Alberta. Exemptions from this regulation can be made only with approval of the Faculty of Agricultural, Life and Environmental Sciences and the Faculty of Education.

## Program Requirements

Courses for the Combined BSc in Human Ecology/BEd Degrees must be carefully sequenced throughout the five years; therefore, students should plan their programs carefully with help from Academic Advisors from both Faculties.

### Program Core (★81)

- (see Note 1 and 3)
- ENGL (★6) **OR**
- ENGL (★3) **AND** WRS (★3)
- 
- ALES 204 - Communication Fundamentals for Professionals
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- 
- STAT 151 - Introduction to Applied Statistics I **OR**
- SOC 210 - Introduction to Social Statistics
- 
- Free Electives (★3)
- HECOL 100 - Introduction to Principles and Practice in Human Ecology
- HECOL 170 - Introduction to Textiles
- HECOL 201 - Introduction to Material Culture
- HECOL 210 - Intimate Relationships
- HECOL 211 - Human Sexuality
- HECOL 250 - Design Studies and Practice
- HECOL 313 - Family Dynamics
- HECOL 254 - Apparel Design and Construction Fundamentals
- 
- HECOL 321 - Introduction to Family Finance **OR**
- HECOL 322 - Family Economic Issues
- 
- HECOL (★9) (see Note 4)
- HECOL at 400-level (★3)
- HE ED 110 - Introduction to Personal Health and Well-Being
- 
- NU FS 200 - Introduction to Functional Foods and Nutraceuticals **OR**
- NU FS 223 - The Cultural Ecology of Food and Health **OR**
- NU FS 372 - Food Chemistry **OR**
- NU FS 373 - Food Chemistry
- 
- NUTR 100 - Nutrition and Wellbeing
- NU FS 100 - Introduction to Food Science and Technology
- 
- MARK 312 - Marketing Research **OR**
- NS 390 - Research Methods in Native Studies **OR**
- PSYCO 212 - Introduction to Research Methods in Psychology **OR**
- SOC 315 - Introduction to Social Methodology **OR**
- W ST 302

### ★6 Natural Sciences from

- (see Note 4)
- BIOL,
- CHEM,
- PHYS,
- EAS (Faculty of Science),
- PSYCO (Faculty of Science)

### BEd Core (★69)

- Minor (★18) (See Note 2)
- EDU 100 - Contexts of Education
- EDU 210 - Introduction to Educational Technology

- EDU 211 - Aboriginal Education and Contexts for Professional and Personal Engagement
- 300-level EDSE course (Minor) (★3)
- EDSE 307 - Language, Literacy and Society in Educational Contexts
- EDSE 317 - Curriculum and Teaching for Secondary School Career and Technology Studies Majors I
- EDSE 417 - Curriculum and Teaching for Secondary School Career and Technology Studies Majors II
- EDSE 451 - Integrating Theory and Classroom Practice in the Advanced Professional Term
- EDPS 410 - Ethics and Law in Teaching
- EDPY 301 - Introduction to Inclusive Education: Adapting Classroom Instruction for Students with Special Needs
- EDPY 303 - Educational Assessment
- EDPY 304 - Adolescent Development and Learning
- EDFX 350 - Secondary Route Field Experience for the Introductory Professional Term
- EDFX 450 - Secondary Route: Advanced Field Experience

### Notes

1. Professional Designation: To meet the educational requirements for Professional Human Ecologist designation, students must present ★36 in Human Ecology, Nutrition and Food Science, or Nutrition, including HECOL 100, plus ★12 in course work closely related to their specialization.
2. Students should declare their minor early in the program by filling out a form in 231 General Services Building. To decide on a minor, consult Education Chart 2.
3. The Management in Organizations and Capstone Course requirements in Degrees Offered and Human Ecology, BSc are met by completion of Faculty of Education requirements.
4. Students in the Combined BSc Human Ecology/BEd degree cannot take HECOL 301. HECOL 268, HECOL 270 or HECOL 354 are recommended. HECOL 300 is not recommended..

### Year 1 (★30) Taken in the Faculty of Agricultural, Life and Environmental Science

- ENGL (★3)
- ENGL or WRS (★3)
- ECON 101 - Introduction to Microeconomics
- ECON 102 - Introduction to Macroeconomics
- HECOL 100 - Introduction to Principles and Practice in Human Ecology
- HECOL 201 - Introduction to Material Culture
- HECOL 170 - Introduction to Textiles
- NUTR 100 - Nutrition and Wellbeing
- EDU 100 - Contexts of Education

### ★3 Natural Sciences from

- BIOL,
- CHEM,
- PHYS,
- EAS (Faculty of Science),
- PSYCO (Faculty of Science)

### Year 2 (★30) Taken in the Faculty of Agricultural, Life and Environmental Sciences

- ALES 204 - Communication Fundamentals for Professionals
- NU FS 100 - Introduction to Food Science and Technology
- 
- STAT 151 - Introduction to Applied Statistics I **OR**
- SOC 210 - Introduction to Social Statistics (SOC 210 recommended) (See Note 1) (★3)
- 
- HECOL 250 - Design Studies and Practice
- HECOL 210 - Intimate Relationships
- HECOL 211 - Human Sexuality
- HE ED 110 - Introduction to Personal Health and Well-Being
- Minor: choose any course from the specific teaching minor (★6)

### ★3 Natural Sciences from

- BIOL,
- CHEM,
- PHYS,
- EAS (Faculty of Science),
- PSYCO (Faculty of Science)

### Year 3 (★30) Taken in the Faculty of Agricultural, Life and Environmental Sciences

- EDU 210 - Introduction to Educational Technology
- MARK 312 - Marketing Research **OR**
- PSYCO 212 - Introduction to Research Methods in Psychology **OR**
- SOC 315 - Introduction to Social Methodology **OR**
- W ST 302 (See Note 1)
- HECOL 313 - Family Dynamics
- HECOL 321 - Introduction to Family Finance **OR**
- HECOL 322 - Family Economic Issues
- HECOL 254 - Apparel Design and Construction Fundamentals
- Free Elective (★3)
- EDU 211 - Aboriginal Education and Contexts for Professional and Personal Engagement
- NU FS 200 - Introduction to Functional Foods and Nutraceuticals **OR**
- NU FS 223 - The Cultural Ecology of Food and Health **OR**
- NU FS 372 - Food Chemistry **OR**
- NU FS 373 - Food Chemistry
- Minor: choose any two courses from the specific teaching minor (★6)

### Years 4 and 5 (★60) Taken in the Faculty of Education

Students should refer to their individual Program Sheet for proper course sequencing.

#### Course Requirements (★30)

- EDSE 3XX (Minor) (★3)
- EDPS 410 - Ethics and Law in Teaching
- EDPY 301 - Introduction to Inclusive Education: Adapting Classroom Instruction for Students with Special Needs
- EDPY 304 - Adolescent Development and Learning
- HECOL Option (★9)
- HECOL 400-level (★3)
- Minor: choose any course from the specific teaching minor (★6)

#### Field Experience Terms (★30)

- Courses taken in the Field Experience Terms are normally taken concurrently.

#### Introductory Professional Term (★15)

- EDFX 350 - Secondary Route Field Experience for the Introductory Professional Term
- EDPY 303 - Educational Assessment
- EDPY 307
- EDSE 317 - Curriculum and Teaching for Secondary School Career and Technology Studies Majors I

#### Advanced Professional Term (★15)

- EDFX 450 - Secondary Route: Advanced Field Experience
- EDSE 451 - Integrating Theory and Classroom Practice in the Advanced Professional Term
- EDSE 417 - Curriculum and Teaching for Secondary School Career and Technology Studies Majors II

**Note:** Students are advised to consider prerequisite courses for advanced courses when planning their program, e.g., SOC 315 requires SOC 100 and SOC 210 as prerequisites.

## Certificates

### Certificate in Community Engagement and Service-Learning

Students in the Faculty of Agricultural, Life and Environmental Sciences are encouraged to pursue the Certificate in Community Engagement and Service-Learning. See Certificate in Community Engagement and Service-Learning for the requirements of the certificate.

### Certificate in Sustainability

The Certificate in Sustainability will provide undergraduate students formal recognition for the knowledge about sustainability that they have acquired during the course of their academic career. The certificate will indicate to employers that the student has gained a baseline understanding of sustainability which complements their primary areas of expertise.

The Faculty of Agricultural, Life and Environmental Sciences is the administrative unit for the Certificate in Sustainability, although students who earn this certificate can take courses from other participating Faculties offering courses that can be counted toward the certificate. Normally the requirements for the Certificate in Sustainability can be completed as part of the requirements for the degree; however, in some cases, a student may need to take more than the minimum required for their degree program in order to qualify for both the degree and the certificate. The Certificate in Sustainability will be available to undergraduate students who are enrolled in degree programs offered by participating Faculties.

While completing the undergraduate program in their respective Faculties, students will be required to complete a minimum of ★12 from a list of designated courses. These courses will be categorized into two categories: "Core courses" and "Electives." Students will be required to complete at least ★6 in each category. In addition, students will complete a final "integrative project" worth ★3, which will engage directly with the core features of sustainability and serve as the de facto "capstone" experience for participating undergraduate students.

Students will be asked to complete an "intention to complete the certificate" form available at the Office of Sustainability's website: [www.sustainability.ualberta.ca](http://www.sustainability.ualberta.ca) and the Faculty of Agricultural, Life and Environmental Sciences (ALES) website: [www.ales.ualberta.ca](http://www.ales.ualberta.ca).

Application for the certificate is made to the ALES's Student Services office: [www.ales.ualberta.ca/ContactUs/StudentServices.aspx](http://www.ales.ualberta.ca/ContactUs/StudentServices.aspx) by February 1 for Spring Convocation and September 1 for Fall Convocation. At present, this certificate is not available to students who have already completed their degrees or who are not receiving a degree at the appropriate convocation.

For information about the Certificate in Sustainability, contact: Student Services, ALES, 2-06 Agriculture Forestry Centre, [www.ales.ualberta.ca/CurrentStudents/UndergraduateStudentServicesOffice.aspx](http://www.ales.ualberta.ca/CurrentStudents/UndergraduateStudentServicesOffice.aspx) or contact the Academic Director with the Office of Sustainability [www.sustainability.ualberta.ca/AboutUs/ContactUs.aspx](http://www.sustainability.ualberta.ca/AboutUs/ContactUs.aspx)

Students may pursue the Certificate in Sustainability by fulfilling existing requirements for majors, minor or honors in their respective disciplines and by completing the following:

1. ★6 in core courses from the preapproved list of academic courses listed by the Office of Sustainability and the Faculty of Agricultural, Life and Environmental Sciences.
2. ★6 in elective courses from the preapproved list of academic courses by the Office of Sustainability and the Faculty of Agricultural, Life and Environmental Sciences
3. ★3 in an integrative project to be approved by Office of Sustainability Academic Director or designate(s).

#### Notes

1. A maximum of ★3 from any given course can be used for the certificate
2. No more than ★3 of the ★15 may be transfer credits from other postsecondary institutions.
3. ★3 "integrative project". The final project will engage directly with the core features of sustainability and will serve as the de facto "capstone" experience for participating undergraduates. The certificate stresses the importance of projects that involve community engagement, the testing of, or the implementation of concepts learned in the classroom.

Forms that the integrative project can take include:

- A field course
  - An internship
  - A Community Service Learning (CSL) course
  - An Undergraduate Research Initiative (URI) supported research project
  - A course that explicitly includes a student-led research project
  - Independent study with a professor that involves research outside the University
4. Project presentation. All students that participate in the Certificate will be required to present their findings, in poster presentations, at periodic undergraduate presentation events hosted by the University of Alberta (e.g. URI, CSL, or Office of Sustainability).

5. The certificate will be awarded at the time the students earn their undergraduate degree.
6. Must be enrolled in a major that is part of the participating Faculties.
7. Students must be in good academic standing at the time they register for the certificate and they must maintain good academic standing as they pursue the certificate. Students must maintain the minimum GPA for continuation in their respective programs.

Students will be required to register for the certificate no later than September 30 of their third year, or at completion of ★60 if studying part-time. No more than half of the course requirements for this certificate may overlap with the requirements of another certificate. This certificate is conceived as an interdisciplinary one, and at least one of the courses in the certificate must be taken from an outside Faculty. Indeed, this certificate encourages students to undertake an interdisciplinary approach to education.