

# Faculty of Agricultural, Life and Environmental Sciences

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## 30 The Faculty of Agricultural, Life and Environmental Sciences

### 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.

## 31 The Professors

### 31.1 Teaching and Scholarship

Our professors are renowned across campus for their willingness and enthusiasm to provide excellent guidance and teaching to our students. Staff members help students choose options and advise them on career opportunities. Students are encouraged to explore their chosen fields and develop practical skills.

Faculty are involved in the full chain of scholarly activity, from generation (research) and integration to dissemination (teaching and extension). Our teaching and research activities have gained international recognition and various awards. Combined with our patented discoveries, they are a testament to our continued commitment to excellence. Awards received over the past five years include:

**AHFMR Chair**  
N Willows

**Academic Woman's  
Association Women of the  
Year Award**  
L McCargar (2006)

**Agriculture Institute of  
Canada Fellow Award**  
J Kennelly (2011)

**Alberta Agriculture Hall of  
Fame Induction**  
I Morrison (2010)  
F Robinson (2006)

**Alberta Ingenuity New  
Faculty Award**  
N Erbilgin (2009)  
U Hacke (2008)

**ASTech Award for Excellence  
in Science and Technology  
Public Awareness**  
J Acorn (2010)

**ASTech Award for Innovation  
in Agricultural Sciences**  
D Bressler (2011)  
L Dosdall (2010)  
L McMullen (2009)  
M Stiles (2009)

**Boreal Leadership Individual  
Trailblazers Award**  
Fiona Schmiegelow

**Canada Research Chairs**  
N Erbilgin  
M Gaenzle  
U Hacke

**F He**  
B Parlee (Joint appointment with  
Native Studies)

R Weselake

**Dieticians of Canada Fellow**  
L McCargar (2006)

**Fellow of the Agricultural  
Institute of Canada**  
JJ Kennelly (2011)

**Fellow of the Poultry Science  
Association**  
FE Robinson (2007)

**Fellow of the Royal Society  
of Canada**  
M Tyree (2008)  
WL Adamowicz (2007)

**International Union of Forest  
Research Organizations  
Scientific Achievement  
Award**  
J Zwiazek (2010)

**Killam Annual Professorship**  
L McCargar (2009)  
M Luckert (2008)  
E Macdonald (2007)  
N Keating (2007)  
CJ Field (2006)

**McCalla Research  
Professorship**  
D Davidson (2011)  
D Spaner (2009)  
J Zwiazek (2009)  
C Field (2008)  
N Krogman (2007)  
LM McMullen (2006)

**NACTA Distinguished  
Educator Award**  
F Robinson (2010)

**NACTA Teaching Award of  
Merit**  
D Barreda (2011)  
S Mohapatra (2010)  
B Steiner (2009)  
D Davidson (2008)

**NACTA Teaching Fellow  
Award**  
L McMullen (2010)  
C Wilkinson (2010)

**NSERC Industrial Research  
Chair**  
S Landhauser  
VJ Lieffers

**NSERC Michael Smith Award  
for Science Promotion**  
John Acorn (2008)

**Premier's Alberta Food for  
Health Award**  
F Temelli (2010)  
T Vasanthan (2010)

**Provost's Award for Early  
Achievement of Excellence in  
Undergraduate Teaching**  
D Barreda (2011)

**3M Teaching Fellowship**  
FE Robinson (2007)

**University Professor**  
WL Adamowicz (2008)

**University Professor and  
Fellowship in the Canadian  
Academy of Health Sciences**  
T Clandinin (2006)

**University of Alberta  
President's Achievement  
Award**  
There's a Heifer in Your Tank  
(2009)

**Vargo Teaching Chair**  
MA Naeth (2010, 2005)

**William Hardy Alexander  
Award for Excellence in  
Undergraduate Teaching**  
K Chandler (2007)

## 31.2 Members of the Faculty

### Officers of the Faculty

#### Dean

JJ Kennelly, PhD

#### Associate Dean (Academic)

N Kav, PhD

#### Associate Dean (Research)

W Dixon, PhD

#### Assistant Dean (Administration)

J Carss, BSc

#### Assistant Dean (Development)

K Crocker, MBA

#### Assistant Dean (International)

M Gomez-Wu, BA

#### Senior Development Officer

K Irwin, BCom

#### Communications Director

M Proulx, BA

#### Development Coordinator

K Horricks

#### Manager of Student Services

J Bohun, MA

#### Recruitment Officer

M Brooks, MBA

#### Research Facilitator

L Secchia-Ballanyi, BA

### Agricultural, Food and Nutritional Science

#### Professor and Chair

E Okine, PhD

#### Professors

J Aiken, PhD

D Ambrose (ARD Professor)

R Bell, PhD

M Belosevic (Cross Appointment  
with Biological Sciences)

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

C Chan, PhD (Joint Appointment  
with Physiology)

WT Dixon, PhD

L Dosdall, PhD

CJ Field, PhD

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

L Goonewardene (ARD Professor)

C Jobin, PhD (CAIP Chair in  
Nutrition, Microbes and  
Gastrointestinal Health)

N Kav, PhD

JR King, PhD (Joint Appointment  
with Renewable Resources)

DR Korver, PhD

LJ McCargar, PhD

LM McMullen, PhD

MA Naeth, PhD (Joint  
Appointment with Renewable  
Resources)

JA Ozga, PhD

L Ozimek, PhD

G Plastow, PhD

FE Robinson, PhD (Vice Provost  
and Dean of Students)

D Spaner, PhD

F Temelli, PhD

T Vasanthan, PhD

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

RC Yang, PhD (ARD Professor)

R Zijlstra, PhD

#### Associate Professors

B Ametaj, PhD

D Barreda, PhD (Joint  
Appointment with Science)

M Betti, PhD

D Bressler, PhD

HL Bruce, PhD

J Buteau, PhD

L Casey, PhD (Cross Appointment  
with Pediatrics)

L Chen, PhD

J Curtis, PhD

M Dyck, PhD

A Farmer, PhD

L Gramlich, PhD (Cross  
Appointment with Medicine)

L Guan, PhD

L Hall, PhD

C Li, PhD (AAFC Associate  
Professor)

D Mager, PhD (Joint  
Appointment with Pediatrics)

V Mazurak, PhD

S Miller, PhD (Secondment with  
U of Guelph)

M Oba, PhD

S Proctor, PhD

H Rahman, PhD

P Stothard, PhD

SS Strelkov, PhD

D Vine, PhD

Z Wang, PhD

N Willows, PhD

VV Wismer, PhD

J Wu, PhD

M Zuidhof, PhD

#### Assistant Professors

M Aranda Saldana, PhD

C Bench, PhD

C Fitzsimmons, PhD (AAFC  
Assistant Professor)

R Jacobs, PhD

A Ullah, PhD

B Willing, PhD

#### Adjunct Professors

J Aalhus, PhD

G Ball, PhD

VE Baracos, PhD

J Basarab, PhD

K Beauchemin, PhD

H Beckie, PhD

E Beltranena, PhD

S Blade, PhD

V Carney

K Chang, PhD

P Doyle, PhD

A Haqq

N Harker, PhD

M Hills, PhD

RJ Howard, PhD

SF Hwang, PhD

S Markus, PhD

J Matte, PhD

TA McAllister, PhD

R Mosenthin, PhD

S Moore, PhD

FM Nattress, PhD

J O'Donovan, PhD

P Robson, PhD

AL Schaefer, PhD

A Schieber, PhD

S Shah, PhD

S Sharma, PhD

M Swift, PhD

K Turkington, PhD

J Turner, PhD

C Willenborg, PhD

#### Professors Emeriti

AW Bailey, PhD

RO Ball, PhD

TK Basu, PhD

JP Bowland, PhD

KG Briggs, PhD

RJ Christopherson, PhD

MT Clandinin, PhD

E Donald, PhD

JJ Feddes, PhD

G Foxcroft, PhD

M Gee

RT Hardin, PhD

Z Hawrysh, PhD

C Hiruki, PhD

P Jelen, PhD

JJ Leonard, PhD

H Knowles, PhD

M Makarechian, PhD

GW Mathison, PhD

B Oraikul, PhD

MA Price, PhD

W Sauer, PhD

JS Sim, PhD

MS Spencer, PhD

P Sporns, PhD

ME Stiles, PhD

GR Stringam, PhD

JP Tewari, PhD

E Toop, PhD

VH Vandenberg, PhD

P Walton, PhD

#### Administrative Officers

J Bell, PhD

R Smith, PhD

#### Faculty Service Officers

U Basu, PhD

H Bates, MSc

J Duke, PhD

M Ho, PhD

B Irving, PhD

R Uwiera, PhD

C Wilkinson, DVM

### Human Ecology

#### Associate Professor and Chair

D Williamson, PhD

#### Professors

J Fast, PhD

N Keating, PhD

B Lemire, PhD, Henry Marshall  
Tory Chair (Joint Appointment  
with History and Classics)

#### Associate Professors

R Breitzkreuz, PhD

A Oak, PhD

B Skrypnik, PhD

G Song, PhD

#### Assistant Professors

A Bissonette, PhD

P Dashora, PhD

M Johnson, PhD

R McQueen, PhD

M Strickfaden, PhD

#### Adjunct Professors

SA Chapman, PhD

P Devlieger, PhD

B deVries, PhD

R Gokiert, PhD

J Gierveld, PhD

M Hardy, PhD

M Mayan, PhD

G Renwick, PhD

L Schnirer, PhD

R Wickman, PhD

#### Professors Emeriti

W Adams

L Capjack, MSc

M Cox-Bishop, PhD

EM Crown, PhD

T Dennis, MSc

E Empey

N Gibson, PhD

A Kernalaguén, PhD  
N Kerr, PhD  
D Kieren, 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**  
VJ Lieffers, PhD

### Professors

PG Comeau, PhD  
M Flannigan, PhD  
RF Grant, PhD  
F He, PhD (Canada Research Chair in Biodiversity & Landscape Modeling)  
JR King, PhD (Joint Appointment with Agricultural, Food and Nutritional Science)  
SE Macdonald, PhD  
SA Quideau, PhD  
MA Naeth, PhD (Joint Appointment with Agricultural, Food and Nutritional Science)  
F Schmiegelow, PhD  
B Shoty, PhD (Bocock Chair in Agriculture and Environment)  
U Silins, PhD  
JR Spence, PhD  
J Zwiazek, PhD

### Associate Professors

GW Armstrong, PhD  
D Davidson, PhD (Joint Appointment with Resource Economics and Environmental Sociology)  
N Erbilgin, PhD (Canada Research Chair in Forest Entomology)  
AL Foote, PhD (Joint Appointment with Devonian Botanic Garden)  
U Hacke, PhD (Canda Research Chair in Tree-Water Relations)  
A Hamann, PhD  
S Landhauser, PhD (NSERC/Capital Power/Oilsands Industrial Research Chair in Forest Land Reclamation)

### Assistant Professors

M Dyck, PhD  
G Hernandez Ramirez, PhD  
MD Mackenzie, PhD  
S Nielsen, PhD  
M Poesch, PhD  
S Ryu, PhD  
T Siddique, PhD

### Adjunct Professors

ME Alexander, PhD  
A Anderson, PhD  
A Anyia, PhD  
MA Arshad, PhD  
V Baron, PhD  
J Bhatti, PhD  
LN Carbyn, PhD  
H Carcamo, PhD  
T Faechner, PhD  
J Gould, PhD  
B Grover, PhD  
RJ Hall, PhD  
EH Hogg, PhD  
G Holroyd, PhD  
A Jobson, PhD  
D Khasa, PhD  
B Kishchuk, PhD  
D Locky, PhD  
S Malhi, PhD  
K Mallett, PhD  
G McKenna, PhD  
L Morgantini, PhD  
M Parisien, PhD  
B Pinno, PhD  
M Powell, PhD  
S Pruss, PhD  
S Song, PhD  
MG Sullivan, PhD  
B Thomas, PhD  
M Tyree, PhD  
B White, PhD

### Professors Emeriti

A Bailey, PhD  
JA Beck, PhD  
P Blenis, PhD  
JR Butler, PhD  
DS Chanasyk, PhD  
F Cook, PhD  
P Crown, PhD  
BP Dancik, PhD  
KW Domier, PhD  
MJ Dudas, PhD  
AK Hellum, PhD  
NG Juma, PhD  
G Kachanoski, PhD  
FV MacHardy, PhD  
B McQuitty, PhD  
M Micko, PhD  
PJ Murphy, MScF  
MPK Nyborg, PhD  
S Pawluk, PhD  
JA Robertson, PhD  
RL Rothwell, PhD  
S Titus, PhD  
GR Webster, PhD  
RW Wein, PhD  
P Woodard, PhD  
FC Yeh, PhD

### Administrative Officers

S Gooding, BSc  
RL Longworth, BA (Hon), BSc

### Faculty Service Officers

J Acorn, MSc  
R Belland, PhD (Joint Appointment with Devonian Botanic Garden)

Y Feng, PhD  
R Pelletier, MSc, MA

## Resource Economics and Environmental Sociology

**Professor and Chair**  
B Swallow, PhD

### Professors

WL Adamowicz, PhD  
E Bielawski, PhD  
PC Boxall, PhD  
EW Goddard, PhD (Cooperative Chair in Agricultural Marketing and Business)  
SR Jeffrey, PhD  
NT Krogman, PhD  
MK Luckert, PhD

### Associate Professors

S Anders, PhD  
DJ Davidson, PhD (Joint Appointment with Renewable Resources)  
P Marcoul, PhD  
S Mohapatra, PhD  
J Parkins, PhD  
J Rude, PhD  
JR Unterschultz, PhD

### Assistant Professors

H An, PhD  
F Qiu, PhD  
BL Parlee, PhD (Joint Appointment with Native Studies)  
B Wichmann, PhD

### Distinguished Scholar in Residence

S McClellan

### Adjunct Professors

H Bjornlund  
R Bollman  
S Cash, PhD  
S Gerking  
G Hauer, PhD  
CG Jardine, PhD  
H Krahn, PhD  
BL McFarlane, PhD  
R Haluza-Delay, PhD  
R Mitchell  
R Naidoo, PhD  
TK Nilsson, PhD  
FJ Tough, PhD  
M Weber, PhD  
B White, PhD  
D Yemshanov

### Professors Emeriti

DS Gill, PhD  
MH Hawkins, PhD  
ML Leroth, PhD  
WE Phillips, PhD  
JJ Richter, PhD  
MM Veeman, PhD  
TS Veeman, PhD

## 32 General Information

### 32.1 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

#### 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

Majors:

Food Science and Technology  
Nutrition  
Nutrition and Food

#### Preprofessional Program

Pre-Veterinary Medicine

For further information, visit Student Services at 231 General Services Building, 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.

## 32.2 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 specialties. 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.

## 33 Faculty Regulations

### 33.1 Admission and Transfer

General University admission requirements are detailed in §§13 and 14. Detailed admission requirements for the Faculty of Agricultural, Life and Environmental Sciences are specified in §15.1.

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 Undergraduate Student Services, 231 General Services Building.
- (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 if
  - 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 Undergraduate Student Services, 231 General Services Building 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.

### 33.2 Undergraduate Program Bloodborne Pathogens Policy

The University of Alberta recognizes its duty to minimize the risk of transmission of bloodborne pathogens to/by individuals studying or working at this University.

The Bloodborne Pathogens policy limits the possibility of transmission of bloodborne pathogens within the educational setting. The University recognizes, however, that it is not possible to completely eliminate the risk of infection (see §20.5 University Bloodborne Pathogens Policy).

The Faculty of Agricultural, Life and Environmental Sciences in accordance with the University of Alberta policies and other available guidelines, has developed the following policies concerning bloodborne pathogens. These policies are to be reviewed and adapted, as further information on bloodborne pathogens becomes available.

For students in the BSc Nutrition and Food Science program who are accepted into the Integrated Dietetic Internship, immunization prior to the first internship placement is required. However, for project assistants in the biological sciences areas, Hepatitis B surface antigen testing will be performed by the University Health Centre. For those students who test negative for the Hepatitis B surface antigen (HbsAg), Hepatitis B vaccination will be required. Contact Student Services (231 General Services Building) for details about testing and immunization.

Program restrictions will be applied when necessary to minimize the risk of transmission of bloodborne pathogens from students to other students, experimental subjects and service clients. Program restrictions, in keeping with reasonable accommodation guidelines, can be expected in cases where students test positive for any bloodborne pathogen, or refuse to complete the screening questionnaire, or refuse a questionnaire-based requirement for Hepatitis B testing. Program restrictions may include prohibition from participating in certain activities and procedures performed as part of research, service testing or teaching function.

Since the risk of HIV transmission from students to other students, service clients and experimental subjects is very low for the procedures followed in these settings, HIV risk assessment and testing will not be made a requirement at this time. However, all students accepted into the Faculty of Agricultural, Life and Environmental Sciences are encouraged to undergo HIV testing whenever concerns about infection arise.

**Note:** For updates on changes to medical testing and immunization refer to the Faculty Office.

### 33.3 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, Co-operative 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 §23.8.2 Practicum Intervention Policy.

### 33.4 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 §§23.4(5) and 23.9.2 for information on calculation of GPAs and the academic record.

A review of academic performance is conducted for each student at the end of each Fall/Winter. Decisions regarding continuation will be based on courses completed during Fall/Winter only. Any courses completed during Spring/Summer will not be considered as part of the decision on academic standing.

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 BSc in Nutrition and Food Science (Nutrition Major)**

Continuation in the BSc in Nutrition and Food Science (Nutrition major) requires a GPA of at least 3.0.

Students who do not attain the required GPA will be moved to the Nutrition and Food Science major that best fits their completed courses. The Application of Academic Standing section below will then be applied.

**(3) 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 §§14.5, 23.6.2(3)a, and 220.5.

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 §15.1.10.

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 §23.6.2 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 §§15.1.10 (j)(4) and 23.6.2(3)a.]

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.

(4) **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.

(5) **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.

## 33.5 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 Human Ecology, and BSc Nutrition and Food Science. Students registered in the BSc in Forestry and Forest Business Management degree programs require ★123 to graduate. 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 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, ★123 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.

## 33.6 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 Undergraduate Student Services Office (231 General Services Building) for clarification.

Students wishing to take more than ★15 in a term must have satisfactory standing and approval of the Undergraduate Student Services Office (231 General Services Building).

(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 §11.

## 33.7 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.

## 33.8 Time Limit to Complete Program

Although there is no time limit for degree completion, program requirements change with time. Eight years from the year of original admission, students who have not yet completed their degree and wish to do so must follow the program requirements in the current *Calendar*. Exception requests must be submitted to the Associate Dean (Academic).

## 33.9 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, 231 General Services Building.

**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 §23.8.

## 33.10 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, 231 General Services Building.

# 34 Programs of Study

## 34.1 Degrees Offered

The Faculty offers programs leading to ten BSc degrees with a common structure and one BA (see §32.1 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 Faculties of Arts, Business and Science.

- (1) **Program Core:** The Program Core consists of the central program elements in each degree.
- (2) **Requirements of the Major:** The major focuses specialization within each degree. Most programs offer majors, and some allow a double major. In those programs, one or two majors must be declared (see Note)
- (3) **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).
- (4) **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; additional assistance is available from Undergraduate Student Services (see Note).
- (5) **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.
- (6) **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. Some programs and majors specify the Capstone Course that must be taken (see Note under individual programs or majors); others allow selection from a list of courses or specify a given course in a given year (see Note below).
- (7) **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, lists of APE courses and lists of Capstone Courses for a given year are available from Undergraduate Student Services, 231 General Services Building. The lists are also posted at [www.ales.ualberta.ca](http://www.ales.ualberta.ca)

## 34.2 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 §§34.2.1 and 34.2.2 are available.

### 34.2.1 Internship Program

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

The IP provides experiential learning to augment academic study with an 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 apply for a working visa when applying to the program. Application forms are available at Student Services (231 General Services Building). Applicants must meet a spoken English requirement (see §13.3.2).

Students apply to the program two months before their start date. Students registered in the IP receive assistance in finding suitable work placements. The Internship Coordinator and CAPS: Your U of A Career Centre are responsible for working with IP students to help them conduct an active job search. 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, however, 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, pay part-time tuition and are considered full-time students at the University of Alberta. To successfully complete the IP, students must complete a minimum of eight months of the following WKEXP courses: WKEXP 981, 982, 983. All WKEXP courses are ★0 and are graded on a pass/fail 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 Internship Coordinator and Faculty mentor.

Further information about the IP can be obtained by contacting the Internship Coordinator in the Faculty of Agricultural, Life and Environmental Sciences.

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/coop work. See §23.8.3 for further details.

### 34.2.2 Cooperative Education Program

(1) **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 §64.5 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.

(2) **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.

## 34.3 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.

### 34.3.1 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 §15.1.8. Inquiries about Pre-Veterinary Medicine should be addressed to Undergraduate Student Services, 231 General Services Building, 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 §33.10.

### 34.3.2 Other Preprofessional Programs

Those wishing to apply to professional programs, such as Business, 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

## 34.4 BSc in Agricultural/Food Business Management

### 34.4.1 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 §15.1.1 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.

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

- ★6 ENGL: (two of ENGL 121, 122, 123, 124, and 125 recommended)
- ALES 204
- SMO 301
- ECON 101 and 102
- STAT 151
- ★3 BIOL or CHEM (see Note 1)
- ACCTG 311 and 322
- AREC 200 and 214
- AREC 313, 473, and 484
- AREC 433 or 482
- ECON 281 and 282
- FIN 301
- MARK 301
- MATH 113 or 114
- ★21 Approved Program Electives [see §34.1(4) and Note 2]
- ★12 Free Electives
- ★3 Capstone Course [see §34.1(6), the note under each major below, and Note 3]

**Notes**

- Food Business Management majors are required to take BIOL 107 or 108.
- 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.
- See §34.1 for program planning and structure details.

### 34.4.2 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.

(1) **Requirements of the Major (★21)**

- ★6 Approved Program Electives
- AREC 333 and 384
- AN SC 200
- PL SC 221
- SOILS 210

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

### 34.4.3 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.

(1) **Requirements of the Major (★21)**

- AREC 384 or 333
- CHEM (164 or 261) and 263 (see Note 1)
- NU FS 100, 363, 373 and 374 (see Note 2)

**Notes**

- 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 §34.4.1).
- 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.
- The capstone course for this major is one of AREC 423 or NU FS 450.

### 34.4.4 Cooperative Education Program

See §34.2.2.

## 34.5 BSc in Agriculture

### 34.5.1 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.

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

- ★3 ENGL: (one of ENGL 121, 122, 123, 124 or 125 recommended)
- ALES 204
- ECON 101
- STAT 151
- ★3 from BIOL 107, 108, 207, 208 (see Note)
- AREC 200
- AN SC 200
- MATH 113 or 114
- PL SC 221
- REN R 210
- ★6 Free Electives
- ★3 Capstone Course [see note under each major as well as §34.1(6)]

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

### 34.5.2 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.

(2) **Requirements of the Major (★81)**

- ACCTG 300
- ★6 from 400-level AREC
- AREC 214
- AREC 313, 333, 384, and 473
- AREC 323 or SMO 310
- AREC 365
- AREC 430 or 433
- ECON 102
- ECON 281 and 282
- ENCS 473 or FOREC 473



- k. ★3 ENGL
- l. ★3 from REN R 432 or R SOC
- m. ★24 Approved Program Electives [see §34.1(4)]
- n. ★6 Free Electives

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

### 34.5.3 Animal Science Major

- (1) **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 agri-business industries, government agencies and primary agriculture.

(2) **Requirements of the Major (★81)**

- a. AN SC 260 or ★3 NUTR
- b. AN SC 310, 311, and 312
- c. ★6 from AN SC 461, 462 and 463
- d. ★6 from AN SC 471, 472, 474, 475, and 476
- e. AN SC 484 or 485
- f. AREC 323 or SMO 310
- g. ★9 from BIOL 107, 108, 207 and 208
- h. ★6 from Organic Chemistry, Inorganic Chemistry, or Physics
- i. ECON 102
- j. ★27 Approved Program Electives [see §34.1(4)]
- k. ★6 Free Electives

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

### 34.5.4 Crop Science Major

- (1) **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.

(2) **Requirements of the Major (★81)**

- a. AREC 214
- b. AREC 323 or SMO 310
- c. ★6 from BIOL 107, 108, 207, 208, (BIOCH 200 or PL SC 331), (BIOCH 310 or AN SC 391), EAS 100, 105 (not taken in core)
- d. BOT 340
- e. ECON 102
- f. ★3 ENGL
- g. ★6 from Organic Chemistry, Inorganic Chemistry or Physics
- h. PL SC 324, 355, and 495
- i. ★6 from ENT 207, PL SC 352, 380
- j. ★3 from ENCS 356, PL SC 354, 357
- k. PL SC 465 or SOILS 460
- l. ★27 Approved Program Electives [see §34.1(4)]
- m. ★6 Free Electives

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

### 34.5.5 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.

### 34.5.6 Sustainable Agricultural Systems Major

- (1) **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.

(2) **Requirements of the Major (★60)**

- a. ★3 from AREC 333, 384, 473
- b. ★6 from AN SC 471, 472, 474, 475, 476, ENCS 356, PL SC 354, 355, 357, 440
- c. ★6 from AN SC 391, BIOCH 200 or PL SC 331, BIOL 107, 207, EAS 100, 105, Organic Chemistry, Inorganic Chemistry, PHYS
- d. ★3 from EAS 221, FOREN 201, REN R 410
- e. SOILS 420
- f. REN R 250
- g. ENCS 461
- h. AREC 365
- i. REN R 450
- j. R SOC 355
- k. ★24 Approved Program Electives [see §34.1(4)]

**Note:** The capstone course for this major is one of AN SC 471, 472, 474, 475, or 476; ENCS 471; PL SC 499.

## 34.6 BSc in Animal Health

### 34.6.1 General Information

- (1) 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.

- (2) 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.
- (3) While registered in the BSc Animal Health program students may complete the requirements for Pre-Veterinary Medicine (§34.3.1) 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.

(4) **Requirements of the program (★72)**

- a. ALES 204
- b. AN SC 100
- c. AN SC 411
- d. AREC 200 or 323
- e. BIOCH 200
- f. BIOL 107, 108, 207, 208
- g. CHEM 101, 102 and 261
- h. ECON 101 and 102
- i. ★3 ENGL
- j. IMIN 200
- k. ★3 MATH
- l. MICRB 265
- m. STAT 151
- n. ★12 Free Electives
- o. ★3 Capstone [see Note 2 and 34.1(6)]

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

## 34.6.2 Companion and Performance Animals Major

- (1) **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.
- (2) **Requirements of the major (★48)**
- AN SC 110, 120, 260, 310, 311, 312, 378, 496
  - PSYCO 104, 281
  - ★3 from AN SC 412 or 464
  - ★15 Approved Program Electives [see §34.1(4)]

## 34.6.3 Food Animals Major

- (1) **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.
- (2) **Requirements of the major (★48)**
- AN SC 200, 260, 310, 311, 312, 377
  - ★3 from AN SC 461, 462, 463
  - ★6 from AN SC 471, 472, 474, 476
  - NU FS 100, 363
  - ★15 Approved Program Electives [see §34.1(4)]

## 34.6.4 Food Safety and Quality Major

- (1) **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.
- (2) **Requirements of the major (★48)**
- AN SC 200
  - ★3 from AN SC 471, 472, 474, 476
  - ★9 from AN SC 320, 322, 420, NU FS 403, 404
  - NU FS 100, 312, 361, 427, 480
  - IMIN 324
  - ★15 Approved Program Electives [see §34.1(5)]

## 34.7 BA in Environmental Studies

### 34.7.1 General Information

- (1) 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.

- (2) This program is not available as an After Degree.

### (3) 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 ★78, are common to all routes within the program:
- ★6 Junior ENGL
  - ★3 Humanities (See Arts Chart 1, Group 2)
  - ★3 Fine Arts (See Arts Chart 1, Group 1)
  - BIOL 108
  - ECON 101
  - ENCS 352
  - NS 200
  - PHIL 355
  - POLS 101
  - REN R 250
  - STAT 141 or 151
  - ★3 from ANTHR 230, REN R 260, STS 200
  - ★6 from PL SC 221, REN R 120, 205, 210
  - ★3 from AREC 365 or ECON 369
  - EAS 221
  - ★6 ENST 400
  - AREC 173
  - EAS 205
  - NS 435
  - POLS 230 or 240
  - BIOL 208
  - ★3 from AREC 313, HGP 399, NS 390, SOC 210
  - ★3 from ENCS 473 or HGP 450

In addition to the courses listed above, students must select two of the following concentrations: Canadian Environmental Studies, Global Political Ecology, Indigenous Environmental Studies, Sociology of the Environment, and Urban Environments, for additional courses up to ★30. There are ★12 credits in free electives

### Canadian Environmental Studies

- (1) **General Information:** This concentration brings together the diverse knowledge required to understand the environmental challenges facing Canadians as well as the proposed solutions that are the subject of public debates.
- (2) **Requirements of the Concentration (★15 from below).** Other courses may be approved annually if they relate significantly. Updated lists of courses that can be counted towards this concentration will be available from the Undergraduate Student Services Office (231 GSB).
- POL S 333; one of BIOL 333, 366, 367 or REN R 364, BIOL 381; one of POLS 327 or NS 240; HIST 359; one of POL S 325, 385, 429, 432, 440, 470, or SOC 372.

### Global Political Ecology

- (1) **General Information:** This concentration introduces students to political ecology as an interdisciplinary, multi-scalar framework for analyzing social problems and ecological problems. Political ecology has roots in the discipline of human geography and has been strongly shaped by the theoretical approaches of political economy, cultural studies, and gender analysis.
- (2) **Requirements of the Concentration (★15 from below).** Other courses may be approved annually if they relate significantly. Updated lists of courses that can be counted towards this concentration will be available from the Undergraduate Student Services Office (231 GSB).
- POL S 333; R SOC 355; one of SOC 269, POL S 345, 364, R SOC 365, or W ST 310; one of HGP 452 or POL S 434; one of INT D 303, AREC 375, 485.

### Indigenous Environmental Studies

- (1) **General Information:** The concentration introduces students to indigenous perspectives and issues in environment and resource management.
- (2) **Requirements of the Concentration (★15 from below).** Other courses may be approved annually if they relate significantly. Updated lists of courses that can be counted towards this concentration will be available from the Undergraduate Student Services Office (231 GSB).
  - a. ANTH 323, HGP 250; NS 390; R SOC 355; one of HIST 460 or NS 380; NS 403.

### Sociology of the Environment Concentration

- (1) **General Information:** This concentration will offer students an in-depth understanding of the applications of sociology to environmental problems.
- (2) **Requirements of the Concentration (★15 from below).** Other courses may be approved annually if they relate significantly. Updated lists of courses that can be counted towards this concentration will be available from the Undergraduate Student Services Office (231 GSB).
  - a. SOC 212, 334, 352; R SOC 355, 365, 450

### Urban Environments

- (1) **General Information:** This concentration focuses on the links between the environment and human settlement. Principles and practices of land use planning and environmental planning will be used to examine the development and use of urban areas. Students will explore current urban issues.
- (2) **Requirements of the Concentration (★15 from below).** Other courses may be approved annually if they relate significantly. Updated lists of courses that can be counted towards this concentration will be available from the Undergraduate Student Services Office (231 GSB).
  - a. HGP 210, 240, 355, 499; POLS 434

## 34.8 BSc in Environmental and Conservation Sciences

### 34.8.1 General Information

- (1) 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.

- (2) 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 the Undergraduate Student Services Office (231 GSB) about selection of Approved Program Electives.

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

- a. ★6 ENGL or ★3 ENGL and ALES 204 or WRS
- b. AREC 365
- c. ECON 101
- d. STAT 151
- e. BIOL 108 and 208
- f. CHEM 101
- g. REN R 110, 201, 210, 205, 260, 307, and 350
- h. REN R 299 (field school) (See Note 1)
- i. MATH 113 or 114
- j. R SOC 375
- k. ENCS 473
- l. PL SC 221
- m. ★9 Free Electives [see §34.1(6) and Note]

#### Notes

- (1) REN R 299 is a spring course normally taken between second and third year.
- (2) See §34.1 for program planning and structure details.
- (3) All majors in the ENCS program have a minimum ★3 capstone. See specific majors for more details.

### 34.8.2 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.

#### (1) Requirements of the Major (★51)

- a. AREC 214
- b. REN R 120, 322, 364, 376, 464
- c. ★3 from REN R 468, 469 or 480
- d. REN R 366 or 440
- e. REN R 462 or 476
- f. ★3 Capstone Course [REN R 496]
- g. ★21 Approved Program Electives [see §34.1(4)]

### 34.8.3 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.

#### (1) Requirements of the Major (★51)

- a. AREC 214, 313, 465
- b. ECON 102, 281, 282
- c. ENCS 352
- d. ECON 369 (see Note)
- e. R SOC 355
- f. ★6 Capstone Course [AREC 410]
- g. ★18 Approved Program Electives [see §34.1(4)]

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

### 34.8.4 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 §34.10 for information on the BSc in Environmental and Conservation Sciences/BA in Native Studies combined degrees with the Human Dimensions of Environmental Management major.

(1) **Requirements of the Major (★51)**

- a. AREC 173
- b. ENCS 352
- c. R SOC 355, 365, 450
- d. REN R 271
- e. SOC 291 and 315
- f. ★6 from R SOC 430, 442 or 460
- g. ★6 Capstone Course [R SOC 410]
- h. ★15 Approved Program Electives [see §34.1(5)]

### 34.8.5 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.

(1) **Requirements of the Major (★51)**

- a. ★3 CHEM 261 or 164
- b. REN R 120, 441, 482, 483
- c. ★3 from REN R 442, 443, 444, 445
- d. ★3 from BOT 322; ENCS 406, 407, REN R 327; PL SC 352
- e. ★6 from BOT 322; ENCS 406, 407; REN R 321, 327, 442, 443, 444, 445; PL SC 352
- f. ★3 from REN R 327, 366, 440, 442, 443, 444, 445; ENCS 406, 407; PL SC 352
- g. ★6 Capstone Course [REN R 495]
- h. ★15 Approved Program Electives [see §34.1(4)]

### 34.8.6 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.

(1) **Requirements of the Major (★51)**

- a. NS 200, 390, 435
- b. REN R 364, 365, 376, 463, 466, 473, 480
- c. ★3 Capstone Course [REN R 491]
- d. ★18 Approved Program Electives [see §34.1(4)]

### 34.8.7 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.

(1) **Requirements of the Major (★51)**

- a. ENCS 356 and 406
- b. REN R 120, 376, 474
- c. REN R 441 or 445
- d. PL SC 352 and 354
- e. REN R 340 or 440
- f. AREC 333 or R SOC 355
- g. ★3 Capstone Course [AN SC 474, ENCS 471 or REN R 496]
- h. ★18 Approved Program Electives [see §34.1(5)]

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

### 34.9.1 General Information

- (1) 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 non-government 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.

- (2) 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 §183.1.14)

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 §183.1.14).

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 §§15.1.5 and 15.1.10).

- (3) Courses are taken in both languages in every year of the program. 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.

(4) **Required Courses**

See §34.8 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 §34.8.2 through §34.8.7.

Students will take ★60 at Faculté Saint-Jean (see §184.11.2 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 323
- REN R 205, 260, 307, and ENCS 473
- PL SC 221
- REN R 110, 250 and 299 (field school; See Note)
- REN R 210

#### Major Core Courses (See §34.8.2 through §34.8.7 for specific major requirements)

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

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

### 34.9.2 Appeals and Graduation

#### (1) 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.

#### (2) 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.

## 34.10 BSc in Environmental and Conservation Sciences/BA in Native Studies Combined Degrees—Human Dimensions of Environmental Management Major

### 34.10.1 General Information

(See §§15.1.3 and 15.10.4)

- 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 (★75)** (See notes and §123.5.2)

- ★6 ENGL: (two of ENGL 121, 122, 123, 124 or 125); or ALES 204 and ★3 ENGL
- AREC 214, 323, and 365.
- ECON 101 and 102
- STAT 151
- BIOL 108 and 208
- ★3 Organic Chemistry
- ★3 from CHEM, PHYS 124, 126

- REN R 205, 260, 307, and ENCS 473
- REN R 299 (field school) (see Note 4)
- MATH 113 or 114
- REN R 110 and 250
- R SOC 355
- REN R 210
- PL SC 221
- ★3 Free Elective (see Note 1)
- R SOC 430 [★3 Capstone Course, (see §34.1(6))]

**Note:** The Capstone Course for this major is R SOC 430.

- Requirements of the Human Dimensions in Environmental Management Major (★33)**

- AREC 450 or R SOC 365
- ENCS 352
- REN R 271
- SOC 315 (see Note 3)
- ★21 Approved Program Electives [see Note 1 and §34.1(5) and Note]

- 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, 111, 290, 390
- ★6 from NS 152, (or NS 105 and 153)
- ★6 NS courses at the 200- or 300-level (see Notes 1, 2, and §123.1.3 Cross-listed Courses)
- ★6 NS courses at the 400-level (see §123.1.3 Cross-listed Courses)

#### Notes

- 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, ★3 NS 100; and the Approved Program Electives. See §123.1.2 for courses that meet Fine Arts, Humanities and Social Science basic requirements.
- Students with greater than ★24 transfer credit will take NS 200-level or higher (excluding NS 200).
- The SOC 315 prerequisite (SOC 210) has been waived.
- REN R 299 is normally taken in the spring between second and third year.
- See §34.1 for program planning and structure details.

### 34.10.2 Appeals and Graduation

#### (1) 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.

#### (2) 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 §§33.4 and 122.6.

## 34.11 BSc in Forest Business Management

### 34.11.1 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 §15.1.6 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.

#### (1) Requirements of the BSc in Forest Business Management Program Core (★123)

- a. ★3 ENGL (one of ENGL 121, 122, 123, 124, or 125 recommended)
- b. ALES 204
- c. ★3 from SMO 301, 311, 321
- d. ECON 101 and 102
- e. STAT 151
- f. CHEM 101 or 164
- g. ACCTG 311 and 322
- h. AREC 214
- i. BIOL 208
- j. ★6 400-level Approved Program Electives from the Faculty of Business [see §34.1(4)]
- k. ECON 281
- l. REN R 205 or 364
- m. ENT 380
- n. FIN 301
- o. REN R 299 (field school) (See Note 1)
- p. REN R 101, 215, 314, 322 and 323 (See Note 1)
- q. FOR EC 345 and 473
- r. REN R 335 and 345
- s. MARK 301
- t. MATH 113 or 114
- u. PL SC 221 and 385
- v. REN R 110, 120, 201, 321, 340, 350, and 430
- w. REN R 210
- x. ★3 Free Electives
- y. MGTSC 312 or AREC 313
- z. ★3 Capstone Course [see §34.1(6) and Note 2]

#### 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 §231 for Forest Science course descriptions).
- (2) See §34.1 for program planning and structure details. The capstone for this program is either AREC 423 or REN R 431.

### 34.11.2 Cooperative Education Program

See §34.2.2.

## 34.12 BSc in Forestry

### 34.12.1 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.

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

- a. ★6 ENGL or ★3 ENGL and (★3 WRS or ALES 204).
- b. AREC 214 and 323
- c. ECON 101
- d. STAT 151
- e. CHEM 101 or 164
- f. BIOL 208
- g. MATH 113 or 114
- h. REN R 101 and 299 (field school) (see Note 1)
- i. REN R 110, 120, 201, 205, 210, 215, 260, 321, 322, 323, 340, 350, 364, 430, and 447
- j. FOREC 345 and 473
- k. R SOC 375
- l. ★6 from REN R 314, 327, 335, 345, 414, 421, 423, 426, 452, 456, 522, 523, 535, and 545
- m. ★15 Approved Program Electives [see §34.1(4)]
- n. ★12 Free Electives
- o. ★3 Capstone Course [see Note 3 and §34.1(6)]

#### 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 §231 for Renewable Resources course descriptions).
- (2) The Capstone Course for this program is REN R 431.
- (3) See §34.1 for program planning and structure details.

## 34.13 BSc in Human Ecology

### 34.13.1 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).

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

- a. ★6 ENGL or ★3 ENGL and ★3 WRS
- b. ★3 ALES 204
- c. AREC 323 or SMO 301
- d. ECON 101 and 102
- e. SOC 210 or STAT 151 (see Note 3)
- f. HECOL 100, 201, 300, and 408
- g. ★6 Capstone Course HECOL 409 (see §34.1 Note 6)
- h. ★3 from HGP 399, MARK 312, NS 390, PSYCO 212, SOC 315, W ST 302 (See Note 6)
- i. ★6 Natural Sciences from BIOL, CHEM, EAS (Faculty of Science), PSYCO (Faculty of Science), NUTR 100, NU FS 100, PHYS (see Note 4)
- j. ★6 from Social Science/Humanities (see Note 5)
- k. ★6 Free Electives (see Note 6)

#### 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. CHEM 101 is required for the Textile Science minor. NUTR 100 and BIOL 107 are required for the Community Nutrition minor and one of them must be taken as a Free Elective.
- (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).

- (6) MARK 312 is required for the Fashion Merchandising and Interiors minors. Take the prerequisite MARK 301 as a Free Elective. The prerequisite for MARK 301 (MATH 113) has been waived for Human Ecology students.

### 34.13.2 Practicum Program

- (1) Two courses comprise the Practicum Program in Human Ecology: HECOL 408 and 409. HECOL 408 must be successfully completed prior to completing HECOL 409.
- (2) Students are not permitted to register in Practicum Program courses while on academic warning.
- (3) 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 409.
- (4) 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.
- (5) HECOL 409 is offered in Fall, Winter and Spring Term. Not all cooperating employers offer placements in all terms
- (6) Students registering in Spring Term HECOL 409 will not be eligible for convocation in June immediately following their practicum.
- (7) Because of the intensity of the workload while completing HECOL 409, students must not exceed the ★15 maximum in course registration for that term.
- (8) 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, he/she is normally required to withdraw from the BSc in Human Ecology program.
- (9) Any student who has withdrawn from a Practicum Program course must receive the approval of the Practicum Coordinator to reregister in the course.
- (10) 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.

### 34.13.3 Family Ecology Major

The Family Ecology major with minors in Aging, Child and Youth Studies, Community Diversity, Community Ecology, Community Nutrition, or International Development 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.

- (1) **Requirements of the Major (★45)**
  - a. HECOL 210, 211, 310, 313, 315, 321, 322, 412, 440, and 443
  - b. HECOL 212 or 414
  - c. HECOL 301
  - d. SOC 271
  - e. ★3 Free Elective
- (2) **Requirements of the Minor (★15)**  
See §§34.13.5 to 34.13.9 and 34.13.12 for course requirements.

### 34.13.4 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.

After their first year, students declare a minor in Fashion Merchandising, Interiors, Material Culture and Design Studies, or Textile Science.

- (1) **Requirements of the Major (★45)**
  - a. HECOL 170, 241, 250, 254, 268, 270, 333, 360, 370 and 441
  - b. ★6 from HECOL 354, 454, 460, 462, 464, 465, 469, 470, 473, 476, 490, 493
  - c. ★3 from HECOL 301, MARK 432
  - d. ★6 Free Elective (see Note)

**Note:** Students completing a minor in Fashion Merchandising or Interiors must take MARK 301 as a free elective.

- (2) **Requirements of the Minor (★15)**  
See §§34.13.10, 34.13.11, 34.13.13, and 34.13.14.

### 34.13.5 Minor in Aging

Students in the Family Ecology major (see §34.13.3) may choose to complete a minor in Aging, which focuses on the personal, physical, social, and community strengths and challenges experienced by people in later life families. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
  - a. HECOL 212 or 414
  - b. HECOL 413
  - c. ★9 from ANTHR 110, EDPY 446, INT D 370, 410, PEDS 385, PHIL 386, PSYCO 459, RLS 100, SOC 342, 375, 473, 475

### 34.13.6 Minor in Child and Youth Studies

Students in the Family Ecology major (see §34.13.3) may complete a minor in Child and Youth Studies, which focuses on child and adolescent development from psychological and sociological perspectives, with an emphasis on vulnerable children and youth. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
  - a. PSYCO 223 and HECOL 413
  - b. ★9 from CSL 350, EDPY 446, HECOL 492, INT D 410, LAW 578 (see Note), PEDS 293, PSYCO 327, 423, SOC 224, 321, 342, 377

**Note:** There are no prerequisites for this course; contact the professor to register.

### 34.13.7 Minor in Community Diversity

Students in the Family Ecology major (see §34.13.3) may complete a minor in Community Diversity, which focuses on anthropological, historical, political, and sociological understandings of ethno-cultural and racial diversity that characterizes contemporary Canadian society. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
  - a. HECOL 413
  - b. ★12 (see Note) from ANTHR 110, 150, 207; CSL 350; EDPY 446; HECOL 462, 492; INT D 410; NS 110, 111, 200, 210, 211, 300, 314, 320, 330, 340, 345, 375, 420, 442, 485; PHIL 368; POL S 266, 299, 327; SOC 260, 301, 343, 370; W ST 310, 360

**Note:** At least ★6 must be at the 300- or 400-level.

### 34.13.8 Minor in Community Ecology

Students in the Family Ecology major (see §34.13.3) may complete a minor in Community Ecology, which focuses on human interaction with human-built physical environments in rural and urban settings. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
  - a. ★15 (see Note) from HGP 100, 210, 240, 252, 310, 315, 341, 342, 343, 452; ECON 462; HECOL 462; POL S 333; R SOC 355, 365, 450; SOC 251, 345, 352, 445

**Note:** At least ★6 must be at the 300- or 400-level.

### 34.13.9 Minor in Community Nutrition

Students in the Family Ecology major (see §34.13.3) may complete a minor in Community Nutrition, which focuses on basic principles of nutrition across the lifespan, contemporary dietary patterns, and strategies for addressing nutrition problems and for promoting healthy diets in the community. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
  - a. NU FS 223, 305, 356, and 377
  - b. ★3 from ANTHR 372, HECOL 413, NS 376, NU FS 352, 410, SOC 382

**Notes**

  - (1) NUTR 100 is required as a prerequisite and must be taken as the Natural Science option in §34.13.1.
  - (2) In addition students interested in this minor are required to take BIOL 107 as a Free Elective.

### 34.13.10 Minor in Fashion Merchandising

Students in the Clothing, Textiles and Material Culture major (see §34.13.4) may complete a minor in Fashion Merchandising, which focuses on the marketing, management, and consumption of clothing in the contemporary retail environment. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
- ★3 from HECOL 354, 454, 460, 473
  - ACCTG 300
  - ★9 from MARK 320, 432, 442, 466, 468, 470, SMO 311, 402

### 34.13.11 Minor in Interiors

Students in the Clothing, Textiles and Material Culture major (see §34.13.4) may complete a minor in Interiors which focuses on design practice and material culture theory as they relate to the creation of comfortable and appealing home environments. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
- ★12 from Faculty of Extension Residential Interiors Certificate Program
  - ★3 from ART, ART H, DES, HECOL 462, 465

### 34.13.12 Minor in International Development

Students in the Family Ecology major (see §34.13.3) may complete a minor in International Development, which focuses on international issues and events related to economics, health, human rights, and politics, with a particular emphasis on developing countries. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
- ★15 (see Note) from ANTHR 207, ECON 213, HECOL 413, 462, 492; INT D 303, 370, 410; POL S 260, 266, 357, 359, 396; R SOC 365; SOC 269, 343, 352

**Note:** At least ★6 must be at the 300- or 400-level.

### 34.13.13 Minor in Material Culture and Design Studies

Students in the Clothing, Textiles and Material Culture major (see §34.13.4) may complete a minor in Material Culture and Design Studies which focuses on clothing and other forms of design, and studies their creation, production, and consumption, as well as their historic, cultural and personal interpretations. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
- ★6 from ANTHR, ART, ART H, DES, DRAMA, HIST, SOC, T DES
  - ★9 from HECOL 354, 454, 460, 462, 464, 465, 469, 473

### 34.13.14 Minor in Textile Science

Students in the Clothing, Textiles and Material Culture major (see §34.13.4) may complete a minor in Textile Science which focuses on the very near environment: the fibres, yarns, and fabrics that affect the performance of clothing and textiles used in everyday life. See §34.1(3) and Note.

- (1) **Requirements of the Minor (★15)**
- HECOL 470, 473, 476
  - ★3 from CHEM, MATH, PHYS
  - ★3 from CHEM 261, 263

## 34.14 BSc in Human Ecology/BEd (Secondary) Combined Degrees

- (1) **General Information** (See also §§15.6.6, 15.6.6 and 75.11)

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/BEd (Secondary) Degrees program has been successfully completed. See §15.6.6 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 §22.1.3 Reregistration in Courses. Notwithstanding §22.1.3, 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.

#### (2) 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 (★3)
- ECON 101 and 102 (★6)
- STAT 151 or SOC 210 (★3)
- ★6 Natural Sciences from BIOL, CHEM, PHYS, EAS (Faculty of Science), PSYCO (Faculty of Science) (see Note 4)
- Free Electives (★6)
- HECOL 100, 170, 201, 210, 211, 250, 313, and 254 (★3)
- HECOL 321 or 322 (★3)
- HECOL (★9) (see Note 4)
- HECOL at 400-level (★3)
- HE ED 110 (★3)
- NU FS 200, 223, 372, or 373 (★3)
- NUTR 100 and NU FS 100 (★6)
- MARK 312, NS 390, SOC 315, W ST 302 (★3)

#### BEd Core (★99)

- Minor (★18) (See Note 2)
- EDU 100, 210 and 211 (★9)
- 300-level EDSE course (Minor) (★3)
- EDSE 307, 317, 417, 451 (★12)
- EDPS 410 (★3)
- EDPY 301, 303 and 304 (★9)
- EDFX 350, 450 (★15)

#### 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 §§34.1 and 34.13 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, 270 or 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 (★3)
- ECON 102 (★3)
- HECOL 100 (★3)
- HECOL 201 (★3)
- HECOL 170 (★3)
- Natural Sciences from BIOL, CHEM, PHYS, EAS (Faculty of Science), PSYCO (Faculty of Science) (★3)
- NUTR 100 (★3)
- EDU 100 (★3)

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

- ALES 204 (★3)
- NU FS 100 (★3)
- STAT 151 or SOC 210 (★3) (SOC 210 recommended) (See Note 1) (★3)



4. HECOL 250 (★3)
5. HECOL 210 (★3)
6. HECOL 211 (★3)
7. HE ED 110 (★3)
8. Natural Sciences from BIOL, CHEM, PHYS, EAS (Faculty of Science), PSYCO (Faculty of Science) (★3)
9. Minor: choose any course from the specific teaching minor (★6)

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

1. EDU 210 (★3)
2. MARK 312, PSYCO 212, SOC 315, W ST 302 (★3) (See Note 1)
3. HECOL 313 (★3)
4. HECOL 321 or 322 (★3)
5. HECOL 254 (★3)
6. Free Elective (★3)
7. EDU 211 (★3)
8. NU FS 200, 223, 372, or 373 (★3)
9. 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)

- (1) EDSE 3XX (Minor) (★3)
- (2) EDPS 410 (★3)
- (3) EDPY 301 (★3)
- (4) EDPY 304 (★3)
- (5) HECOL Option (★9)
- (6) HECOL 400-level (★3)
- (7) 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)

- (1) EDFX 350 (★6)
- (2) EDPY 303 (★3)
- (3) EDPY 307 (★3)
- (4) EDSE 317 (★6)

#### Advanced Professional Term (★15)

- (1) EDFX 450 (★9)
- (2) EDSE 451 (★3)
- (3) EDSE 417 (★3)

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

## 34.15 BSc in Nutrition and Food Science

### 34.15.1 General Information

The Faculty offers courses leading to the degree of Bachelor of Science in Nutrition and Food Science with majors in Nutrition and Food, Nutrition, and Food Science and Technology. A minimum of ★120 is required to complete the program for the degree of BSc in Nutrition and Food Science.

Students interested in either the Nutrition and Food major or the Nutrition major begin their program in the Nutrition and Food major. Students interested in transferring to the Nutrition major should contact the Faculty's Student Services Office about the minimum requirements for eligibility; see §15.1.9 for information on admission requirements.

Students in either the Nutrition and Food major or the Nutrition major have the option of completing a minor. By completing a minor in Human Ecology, students can meet the educational requirements for registration as Professional Human Ecologists or Professional Home Economists; students can complete a minor in Physical Activity; or students in the Nutrition and Food major can complete a minor in Food Marketing or Food Policy. Students are recommended to select minors by the second year of their program to facilitate appropriate course selection. All students must follow program and major requirements (see program requirements below and §§34.15.3 and 34.15.4). Students who wish to obtain a minor must select Free Electives and Approved Program Electives (APEs) carefully to meet the course and credit requirements of the minor (see §§34.15.9 to 34.15.7).

The Nutrition major program, with appropriate Approved Program Electives (APEs) course selection, is accredited by the College of Dietitians of Alberta.

Students planning to be Registered Dietitians should read the information about the Nutrition major (see §34.15.4) and the Dietetic Internship (see §34.15.9).

The Food Science and Technology major meets the guidelines of the Institute of Food Technologists (IFT).

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

- a. ★6 ENGL: (two of ENGL 121, 122, 123, 124, or 125 recommended) or ★3 ENGL and ★3 WRS.
- b. ALES 204
- c. AREC 323 or SMO 301
- d. ECON 101 and 102
- e. STAT 151
- f. BIOL 107
- g. ★3 from BIOCH 200 or PL SC 331 (see Note 2)
- h. CHEM 101, 102, (164 or 261) and 263
- i. NU FS 361 or 363 (see Note 1)
- j. NU FS 372 or 373 (see Note 1)
- k. ★12 Free Electives (see Note 3)
- l. ★3 Capstone course [see §34.1(6) and notes following each major]

#### Notes

- (1) Food Science and Technology majors are required to take NU FS 361 and 372.
- (2) Nutrition majors must take BIOCH 200.
- (3) Students in the Nutrition and Food major or the Nutrition major who plan to complete a minor should see §§34.15.5 to 34.15.8 for information that may affect Free Elective course selection. Students planning to apply for Medicine must take ★6 Physics. Students in the Nutrition and Food major are recommended to take NU FS 100.
- (4) See section §34.1 for program planning and structure details.

### 34.15.2 Food Science and Technology Major

This major 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 major 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.

#### (1) Requirements of the Major (★60)

- a. CHEM 211
- b. MATH 113 or 114
- c. MICRB 265
- d. NU FS 100 or NUTR 100 (See Note 1)
- e. NU FS 283, 305, 312, 353, 374, 430, 454, 490, and 499
- f. NU FS 201 (recommended) or PHYS ★3
- g. ★18 Approved Program Electives [★9 must be from advanced (300- or 400-level) Food Science courses as noted on the APE list. Also see §34.1(4) and Note (1)]

#### Notes

- (1) Transfer students who are taking NU FS 372 and 374 in their first year in the program should select an Approved Program Elective or NUTR 100.
- (2) The Capstone course for this major is NU FS 450.

### 34.15.3 Nutrition and Food Major

The Nutrition and Food major provides students with a diverse education in 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 course work in the biological, behavioural and applied sciences.

Graduates of this major may find employment opportunities in a variety of public or private enterprises including health education, health industry or international aid. Careers can also be guided by the selection of a minor in Physical Activity, Human Ecology, Food Marketing, or Food Policy (see §§34.15.5 to 34.15.8), which can position graduates for careers in lifestyle management, the community-based human ecology sector or the agri-food-nutrition sector.

Students in the Nutrition and Food major may transfer to the Nutrition major if they meet its required academic standings and courses by visiting Student Services in 231 General Services Building; this is normally done after first year (see §15.1.9). Students who change to the Nutrition (or Food Science and Technology) major after their first year often require more than four years

to complete the entire program (see §§15.1.9 and 34.15.4 for course selection information for the Nutrition major, and §34.15.2 for the Food Science and Technology major).

- (1) **Requirements of the Major (★60)**
- BIOL 207
  - NUTR 100
  - NU FS 201, 223, 283, 305, 356, 374, 377, 458
  - PHYSL 210 (★6)
  - ★24 Approved Program Electives [★12 must be from advanced (300- or 400-level) NUTR or NU FS courses as noted on the APE list unless a student has declared a minor.] (See Note 1)

#### Notes

- (1) See §34.1(4). Students who plan to complete a minor see §§34.15.5 to 34.15.8 for information regarding Approved Program Elective selection.  
 (2) The capstone course for this major is NU FS 425 or 450.

### 34.15.4 Nutrition Major

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 §34.15.9). Students registered in this major can meet the academic competencies to be eligible for either the Integrated Dietetic Internship or post-degree internships.

Students who elect to complete a minor in Physical Activity or Human Ecology (see §§34.15.5 and 34.15.6) and participate in the Integrated Internship will not be able to meet all course requirements in four years.

Students will be assessed annually to ensure that they maintain a GPA of at least 3.0 in the previous Fall/Winter [see §33.4(2)].

- (1) **Requirements of the Major (★60)**
- PHYSL 210 (★6)
  - BIOCH 310 (see grade requirements for admission to this course)
  - BIOL 207
  - NUTR 100
  - NUTR 301 and 302
  - NUTR 400 and 440
  - NU FS 223, 356, 377, NUTR 468
  - ★9 from NUTR 443, 452, 476, 477, 478, 479, 480, NU FS 410, 424, 428
  - ★12 Approved Program Electives (See Note 1)

#### Notes

- (1) See §34.1(4) and Note. Students who plan to apply for the Integrated Dietetic internship or to complete a minor should see §§34.15.5 to 34.15.9 for information regarding selection of Approved Program Electives.  
 (2) The Capstone course for this major is NUTR 401.

### 34.15.5 Minor in Physical Activity

Students in the Nutrition and Food major (see §34.15.3) or in the Nutrition major (see §34.15.4) may choose to complete a minor in Physical Activity by incorporating the following ★15 into their program by careful selection of their Approved Program Electives and Free Electives. This provides the opportunity to integrate nutrition and food sciences with health and physical activity. See §34.1(4) and Note.

- (1) **Requirements for the Minor (★15)**
- HE ED 110 (taken as a Free Elective)
  - HE ED 220 and 321
  - NUTR 480
  - ★3 from HE ED 221, PEDS 391, PERLS 104, RLS 100

### 34.15.6 Minor in Human Ecology

Students in the Nutrition and Food major (see §34.15.3) or in the Nutrition major (see §34.15.4) may choose a minor in Human Ecology by incorporating the following ★15 into their program through careful selection of their Approved Program Electives and Free Electives. Depending on course selections made in major and minor areas of study, students may be eligible to apply to become a professional Human Ecologist or Professional Home Economist (information is available from 3-02 Human Ecology Building). See §34.1(4) and Note.

- (1) **Requirements for the Minor (★15)**
- HECOL 100
  - HECOL 201
  - HECOL 301
  - ★6 from HECOL 300, 310, 313, 322, 412, 413, 414, 440, 443

### 34.15.7 Minor in Food Marketing

Students in the Nutrition and Food major (see §34.15.3) may choose a minor in Food Marketing by incorporating the following ★15 into their program by careful selection of their Approved Program Electives and Free Electives. This provides the opportunity to apply a nutrition and food science background to consumer and food marketing. See §34.1(4) and Note.

- (1) **Requirements for the Minor (★15)**
- AREC 200
  - AREC 384
  - AREC 484
  - ★6 from PSYCO 281, AREC 323 (if not taken to fulfill Program core), AREC 473, 482, 485, SMO 301 (if not taken to fulfill Program core)

### 34.15.8 Minor in Food Policy

Students in the Nutrition and Food major (see §34.15.3) may choose a minor in Food Policy by incorporating the following ★15 into their program through careful selection of their Approved Program Electives and Free Electives. This provides the opportunity to apply a health, fiscal and agricultural policy perspective to issues of health and food. See §34.1(4) and Note.

- (1) **Requirements for the Minor (★15)**
- AREC 200
  - AREC 473
  - AREC 471
  - ENCS 271
  - HECOL 300

### 34.15.9 Dietetic Internships

Dietitians are employed in health care institutions, industry, government services, retail food services, teaching, community clinics, public relations, the media, and private practice. To become a Registered Dietitian, students must complete an undergraduate degree in Nutrition and a dietetic internship. Students must meet the additional course requirements (beyond those in the Nutrition major) outlined below to be eligible for an accredited dietetic internship. Applicants must meet a spoken English requirement (see §13.3.2)

**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, 469, 470, 471 and 472 prior to convocation.

**Post-degree Internship:** As an alternative to the Integrated Dietetic Internship, eligible students may apply for the post-degree internship in their fourth year. Students applying for post-degree internships through Dietitians of Canada do not complete U of A professional practice courses.

#### Required Course List for Dietetics Students

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. This combination is an accredited university undergraduate program with the College of Dietitians of Alberta.

- (1) **Required Dietetics Courses (★15)**
- INT D 410 (See Note 2)
  - NU FS 374, 461
  - ★3 Approved Program Elective chosen from NUTR 452, 478, 479, NU FS 428
  - NUTR 476

#### 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 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 Alberta's *Protection for Persons in Care Act*, students may be required to satisfy a criminal records check before being allowed to participate in an internship program.

### 34.16 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 §15.1), as well as program, academic standing and graduation requirements of the particular degree program (see §§33.4 and 34). 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.

### 34.17 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 §15.1), as well as program, academic standing and graduation requirements of the particular degree program (see §§33.4 and 34). 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.

### 34.18 Double Majors

A student in any Agricultural, Life and Environmental Sciences undergraduate degree program offering majors may qualify for a double major

in that program by completing a minimum of ★135 for their degree program and satisfying all major core requirements of each of the individual majors.

### 34.19 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 §202 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

(See Addenda April 15, 2014)

### 34.20 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 §45.1 for the requirements of the certificate.

### 34.21 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.

## 35 Courses

The Faculty of Agricultural, Life and Environmental Sciences courses are listed in §231, 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)  
Forest Economics (FOREC)  
Forest Engineering (FOREN)  
Forest Science (FOR)  
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)  
Soil Science (SOILS)  
University (UNIV)  
Work Experience (WKEXP)

## 35 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.

### 35.1 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 §45.1 for the requirements of the certificate.

### 35.2 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 his or her 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.