

*Calendar 1993-1994*

# Your Future is Here

**Nova Scotia Agricultural College**



*Serving Atlantic Canada*



# Your Future is Here



**Nova Scotia  
Agricultural  
College**

Eighty-Eighth Annual  
**Calendar 1993-1994**

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The Nova Scotia Agricultural College reserves the right to make changes, without notice, to all matters contained in this calendar.



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# Academic Calendar

## 1993–1994

### **1993**

August 26, 27	Early registration.
September 9	Registration for first-time students.
September 10	Registration for returning students.
September 13	Fall Semester classes begin.
October 11	Thanksgiving. No classes.
October 27	Autumn Assembly.
November 11	Observance of Remembrance Day. No classes.
December 3	Last day of classes, Fall Semester.
December 6–16	Fall Semester examinations.

### **1994**

January 4	Registration for first-time students.
January 5	Winter Semester classes begin.
February 21–25	Mid-semester break for individual study.
April 1	Good Friday. No classes.
April 8	Last day of classes, Winter Semester.
April 11–21	Winter Semester examinations.
May 6	Convocation.

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# Officers of Administration

## **Principal**

*L.E. Haley*, B.S.A. (Toronto), M.S.A. (Toronto), Ph.D. (California)

## **Principal Emeritus**

*Kenneth Cox*, B.S.A. (Toronto), M.S.A. (McGill), LL.D. (McGill)

## **Vice-Principal**

*I.M. Fraser*, B.Sc. (Dalhousie), M.A. (Maine)

## **Dean, Vocational and Technical Education**

*A.D. Ells*, B.Sc. (Agr.)(McGill), M.A. (Acadia)

## **Registrar**

*V.L. Saxon*, B.Sc. (Dalhousie), B.Ed. (Acadia), B.Eng. (Technical University of Nova Scotia), M.B.A. (Dalhousie)

## **Dean of Student Services**

*R.M. Stevens*, B.B.A. (Acadia), M.Ed. (Acadia)

## **Associate Dean, Research**

*G.J. Pearson*, B.Sc. (Queens), M.Sc. (Queens), B.Ed. (Dalhousie)

## **Chief Librarian**

*B.R. Waddell*, B.A. (Colorado), M.L.S. (Dalhousie)

## **Librarian**

*B.S. Sodhi*, B.A. (Punjab), M.A. (Punjab), Dip.L.Sc. (Punjab)

## **Director of Athletics**

*K.S. Marchant*, B.P.Ed. (New Brunswick), M.S. (Springfield)

## **Placement Officer**

*B.M. Crouse*, B.Sc. (Agr.)(Guelph)

## **Business Manager**

*R.O. Mosher*, B.B.A. (Acadia)

## **Secretary**

*Mrs. Ruby MacKay*

## **Farm Manager**

*E.G. Maynard*, B.S.A. (Toronto), B.Ed. (Mt. Allison), M.S.A. (Guelph)



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# Faculty

## **Principal**

*L.E. Haley*, B.S.A. (Toronto), M.S.A. (Toronto), Ph.D. (California)

## **Agricultural Engineering**

*J.D. Cunningham*, B.S.A. (Toronto), B.E. (Nova Scotia Technical College), M.A.Sc. (Technical University of Nova Scotia)  
Associate Professor and Head

*J.F. Adsett*, B.Sc. (Agr.) (McGill), M.Sc.E. (U.N.B.), Ph.D. (Saskatchewan)  
Associate Professor

*D. Allen*, B.Sc. (Eng.) (Guelph), M.Sc. (Agr.Eng.) (Purdue)  
Associate Professor

*J.P. Blanchard*, B.Sc. (St. Mary's), B.Sc. (Dalhousie), M.Sc. (Agr.Eng.) (Technical University of Nova Scotia), Ph.D. (Technical University of Nova Scotia)  
Assistant Professor

*P.L. Havard*, B.Sc. (Agr.Eng.) (McGill), M.Sc. (McGill)  
Associate Professor

*S.A. Madani*, B.Sc. (Pahlavi), M.Sc. (British Columbia), Ph.D. (Washington)  
Associate Professor

*M.N. Rifai*, M.Sc. (Nitra), Ph.D. (Nitra)  
Associate Professor

*K.J. Sibley*, B.Sc. (Agr.Eng.) (McGill), M.Sc. (McGill)  
Assistant Professor

## **Animal Science**

*D.C. Crober*, B.Sc. (Agr.) (McGill), M.Sc. (McGill), Ph.D. (British Columbia)  
Professor and Head

*P.Y. Hamilton*, B.Sc. (Agr.) (McGill), M.Sc. (Maine)  
Professor Emeritus

*D.M. Anderson*, B.S.A. (Manitoba), M.Sc. (Manitoba), Ph.D. (Saskatchewan)  
Professor

*A.H. Farid*, B.Sc. (Shiraz), M.Sc. (Shiraz), Ph.D. (Alberta)  
Associate Professor

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## Faculty

*N.L. Firth*, B.Sc. (Edinburgh), M.S. (Purdue), Ph.D.(Cornell)  
Associate Professor

*A.H. Fredeen*, B.S.A. (Saskatchewan), M.Sc. (Guelph), Ph.D. (California)  
Associate Professor

*A.W.L. Hawley*, B.Sc. (Queens), M.Sc. (Manitoba), Ph.D. (Saskatchewan)  
Associate Professor

*S.P. Lall*, B.Sc. (Allahabad), M.Sc. (Guelph), Ph.D. (Guelph)  
Adjunct Professor

*A. Lirette*, B.Sc.S (Medicine) (Laval), B.Sc.A. (Laval), M.Sc. (Laval), Ph.D. (Alberta)  
Associate Professor

*W.G. Mathewson*, B.Sc. (Aberdeen), M.Sc. (Aberdeen)  
Professor Emeritus

*E.G. Maynard*, B.S.A. (Toronto), B.Ed. (Mt. Allison), M.S.A. (Guelph)  
Farm Manager

*D.L. Patterson*, B.Sc. (Alberta), M.Sc. (Guelph), Ph.D. (Guelph)  
Associate Professor

*W.B. Ramsay*, D.V.M. (Guelph)  
Associate Professor

*P.H. Robinson*, B.Sc. (Manitoba), M.Sc (Guelph), Ph.D. (Cornell)  
Adjunct Professor

*T. Semple*, D.V.M.  
Sessional Lecturer

*T. Tennessen*, B.A. (Alberta), B.Sc. (Alberta), M.Sc. (Alberta), Ph.D. (Alberta)  
Associate Professor

## Biology

*L.J. Eaton*, B.Sc. (Acadia), M.Sc. (Dalhousie), Ph.D. (Dalhousie)  
Professor and Head

*L.E. Crosby*, B.Sc. (Acadia), M.Sc. (Acadia)  
Associate Professor

*A.B. Gray*, B.Sc. (Bishops), M.Sc. (McGill), Ph.D. (McGill)  
Professor



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## Faculty

*L.E. Haley*, B.S.A. (Toronto), M.S.A. (Toronto), Ph.D. (California)  
Principal and Professor

*J.-P.R. Le Blanc*, B.A. (Montreal), B.Sc. (Quebec), Ph.D. (McGill)  
Professor

*V.O. Nams*, B.Sc. (Toronto), M.Sc. (Alberta), Ph.D. (Victoria)  
Assistant Professor

*A.R. Olson*, B.A. (Augustana), M.Sc. (Wisconsin), Ph.D. (Alberta)  
Professor

*M.G. Sampson*, B.Sc. (Dalhousie), B.Sc. (Agr.) (McGill), M.Sc. (McGill)  
Assistant Professor

*R. Singh*, B.Sc. (Agr.) (Agra Univ.), M.Sc. (Agr.) (Agra Univ.), Ph.D. (N.Dakota)  
Adjunct Professor

*G.W. Stratton*, B.Sc. (Agr.) (Guelph), M.Sc. (Guelph), Ph.D. (Guelph)  
Professor

### ***Chemistry and Soil Science***

*A.R. Robinson*, B.Sc. (Agr.) (McGill), M.Sc. (McGill), Ph.D. (McGill)  
Professor and Head

*W.M. Langille*, B.Sc. (Acadia), M.Sc. (McGill)  
Professor Emeritus

*G.R. Brewster*, B.A., M.Sc., Ph.D. (Western Ontario)  
Associate Professor

*N.L. Crowe*, B.Sc. (Agr.) (McGill), M.Sc. (McGill), Ph.D. (Guelph)  
Assistant Professor

*J.E. Hawley*, B.Sc. (Agr.) (McGill)  
Assistant Professor

*J. Hoyle*, B.A. (Univ. York), B.A. (Open Univ.), M.Sc. (Leeds), Ph.D. (Dalhousie)  
Associate Professor

*H.M. MacConnell*, B.Sc. (Agr.) (McGill), M.Sc. (McGill)  
Associate Professor

*J.C. Miller*, B.Sc. (Agr.) (Guelph), M.Sc. (Alberta)  
Associate Professor

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## Faculty

*A.S. Payne*, B.Sc. (Agr.) (McGill), M.Sc. (McGill)  
Associate Professor

*P.R. Warman*, B.Sc. (Agr.) (Rutgers), M.Sc. (Guelph), Ph.D. (Guelph)  
Professor

*K.A. Havard*, B.Sc. (McGill), M.Sc. (McGill)  
Sessional Lecturer

### ***Economics and Business Management***

*J.C. Tait*, B.Sc. (Agr.) (McGill), M.Sc. (New Hampshire)  
Associate Professor and Head

*D.E. Arnfast*, B.B.A. (St. Francis Xavier)  
Assistant Professor

*J.S. Clark*, B.A. (Guelph), M.Sc. (Saskatchewan), Ph.D. (North Carolina State)  
Associate Professor

*A.D. Ells*, B.Sc. (Agr.) (McGill), M.A. (Acadia)  
Associate Professor and Dean, Vocational and Technical Education

*K.G. Grant*, B.A. (Acadia), M.A. (Western Ontario), Ph.D. (Western Ontario)  
Associate Professor

*S.G. Russell*, B.Sc. (Agr.) (Guelph), M.B.A. (St. Mary's)  
Assistant Professor

*S.J.B. Stackhouse*, B.Sc. (Agr. Ec.) (Guelph), M.Sc. (Guelph)  
Associate Professor

### ***Humanities***

*P.M. Sanger*, B.A. (Melbourne), B.Ed. (Acadia), M.A. (Victoria)  
Associate Professor and Head

*K.B. Beesley*, B.E.S., Ph.D. (Waterloo)  
Associate Professor

*P. Cox*, B.A. (Acadia), M.A. (Toronto)  
Professor Emeritus

*B.M. Crouse*, B.Sc.(Agr.) (Guelph)  
Placement Officer



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## Faculty

*K.S. Marchant*, B.P.Ed. (New Brunswick), M.S. (Springfield)  
Associate Professor

*L.L. Sanderson*, B.Sc. (Agr.) (Guelph), M.Sc. (Guelph)  
Associate Professor

*J.M. Smith*, B.P.Ed. (Dalhousie)  
Assistant Professor

### **Mathematics and Physics**

*C.T. Madigan*, B.Sc. (Windsor), M.Sc. (Windsor)  
Associate Professor and Head

*D.G. Bishop*, B.Eng. (Agr.) (Technical University of Nova Scotia), M.Eng.(Agr.)  
(Technical University of Nova Scotia)  
Associate Professor

*R.G. Farmer*, B.B.A. (U.C.C.B.), M.B.A. (St. Mary's)  
Associate Professor

*I.M. Fraser*, B.Sc. (Dalhousie), M.A. (Maine)  
Associate Professor and Vice-Principal

*M.M. Kupczynski*, M.Sc., Ph.D. (Warsaw)  
Associate Professor

*G.J. Pearson*, B.Sc. (Queens), M.Sc. (Queens), B.Ed. (Dalhousie)  
Associate Professor and Associate Dean of Research

*V.L. Saxon*, B.Sc. (Dalhousie), B.Ed. (Acadia), B.Eng. (Technical University of Nova  
Scotia), M.B.A. (Dalhousie)  
Associate Professor and Registrar

*S.G. Smith*, B.Sc. (Mt. Allison), M.Sc. (Windsor)  
Associate Professor

### **Plant Science**

*C.D. Caldwell*, B.Sc. (Mt. Allison), M.Sc. (Dalhousie), Ph.D. (East Anglia)  
Professor and Head

*J.E. Shuh*, B.S.A. (Toronto), M.Sc. (McGill)  
Professor Emeritus

*S.K. Asiedu*, B.Sc. (Agr.), M.Sc., Ph.D. (McGill)  
Associate Professor

---

## Faculty

*G.N. Atlin*, B.Sc. (Agr.) (Guelph), M.S. (Guelph), Ph.D. (Iowa)  
Assistant Professor

*T.M. Choo*, B.Sc. (Nat. Taiwan Univ.), Ph.D. (McGill)  
Adjunct Professor

*O.W.K. Coleman*, B.A., Ph.D. (Western Ontario)  
Adjunct Professor

*R.W. Daniels*, B.Sc. (Agr.) (McGill), M.S. (Michigan State), Ph.D. (Penn State)  
Professor

*C.D. Goodwin*, B.Sc. (Mt. St. Vincent), M.Sc. (Guelph)  
Lecturer

*S.N. Goodyear*, B.Sc. (Agri.) (McGill), M.Sc., Ph.D. (Guelph)  
Assistant Professor

*W.J. Higgins*, B.Sc. (Mt. Allison), M.S. in Ed. (Niagara)  
Associate Professor

*H-Y. Ju*, B.Sc. (Agronomy) (Seoul), M.Sc. (McGill), Ph.D. (McGill)  
Professor

*L.R. Mapplebeck*, B.Sc. (Guelph), M.Sc. (Guelph)  
Associate Professor

*R.C. Martin*, B.A. (Carleton), M.Sc. (Carleton), Ph.D. (McGill)  
Assistant Professor

*T.M. Mullin*, B.Sc., M.Sc. (New Brunswick)  
Adjunct Professor

*J. Nowak*, M.Sc. (Olsztyn), Ph.D. (Olsztyn), Ph.D.Habil. (Olsztyn)  
Professor

*Y. Papadopoulos*, B.Sc. (Guelph), M.Sc. (Guelph), Ph.D. (Guelph)  
Adjunct Professor

*R.K. Prange*, B.Sc. (Acadia), M.Sc. (British Columbia), Ph.D. (Guelph)  
Adjunct Professor

*R.W. Young*, B.Sc.F. (University of New Brunswick)  
Sessional Lecturer from the N.S. Dept. of Natural Resources



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# Schedule of Payments

## Deposits

In the letter that offers acceptance the student is asked to forward to the Registrar's Office a \$100 program registration deposit and, for students who want a place in residence, a \$125 room deposit. The receipt for \$225 confirms the student's acceptance of the offer of admission, assures the student of a place in the program, and reserves a place for the student in residence. The receipt of the \$100 program deposit, only, confirms the student's acceptance of the offer of admission, assures the student's place in the program, and indicates that the student does not want to have a place reserved in residence. The full amount of the program deposit will be refunded when students cancel their applications before July 30. After this date, there is no refund of the \$100 program deposit. The \$125 residence deposit will be refunded up to but not after June 1 for returning students and up to but not after June 30 for new students. (Residence deposits received from students accepted after June 30, 1993 are non-refundable.)

Deposits are subtracted from the total payments due at registration in September.

The student must have early, conditional, or final acceptance before submitting a deposit.

## Payments at Registration

The College reserves the right to make changes without notice in its published scale of charges for tuition, accommodations and meals, and other fees. Refunds will not be made except as stated below.

The amounts for meals and lodging specified on the next page are for the regular academic year.

Students who are not Canadian citizens or residents pay an additional tuition fee of \$850 per semester and must take out health insurance at a cost of approximately \$600 per academic year.

All payments are due on the dates stated.

Late registration is not permitted unless the circumstances are exceptional. When late registration is permitted, there is a penalty of \$20 for each day after the specified registration dates, unless late registration is due to illness or other compelling compassionate reasons.

Students who intend to finance their education with Canada Student Loan funds but who have not received their Certificate of Eligibility (Schedule 1 form) before registration must pay the required fee at registration time.

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## Schedule of Payments

### University Programs

All charges are subject to change. The fees below are those in effect in **1992/93**. The fee schedule for 1993/94 will be available early in 1993. Tuition fees for foreign students who are non-sponsored are an additional \$1,700 (\$850 per semester).

#### Fall Semester Payment

Tuition .....	\$ 880
Student Union .....	80
Athletics .....	45
Medical Insurance (Non-Canadians) .....	550
Caution and Laboratory Deposit .....	55
Books (estimated) .....	350
Residence Accommodation & Meals (Shared) .....	1850
Residence Accommodation & Meals (Single) .....	2020
Laundry Fee .....	20
House Fee .....	30

#### Winter Semester Payment

Tuition .....	\$ 880
Residence Accommodation & Meals (Shared) .....	1975
Residence Accommodation & Meals (Single) .....	2150
Laundry Fee .....	20
Books (estimated) .....	350

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## Schedule of Payments

### Technician and Technology Programs

*All charges are subject to change.* The fees below are those in effect in **1992/93**. The fee schedule for 1993/94 will be available early in 1993.

Tuition fees for foreign students who are non-sponsored are an additional \$1700 (\$850 per semester).

#### Fall Semester Payment

Tuition .....	\$ 380
Student Union .....	80
Athletics .....	45
Medical Insurance (Non-Canadians) .....	550
Caution and Laboratory Deposit .....	55
Residence Accommodation & Meals (Shared) .....	1850
Residence Accommodation & Meals (Single) .....	2020
Laundry Fee .....	20
House Fee .....	30

#### Winter Semester Payment

Tuition .....	\$ 380
Residence Accommodation & Meals (Shared) .....	1975
Residence Accommodation & Meals (Single) .....	2150
Laundry Fee .....	20
Books (estimated) .....	350

#### Pre-Tech Semester

Tuition .....	\$ 380
Residence Accommodation & Meals (Shared) .....	1975
Residence Accommodation & Meals (Single) .....	2150
Laundry Fee .....	20
Books (estimated) .....	350
Student Union, Athletics, etc. ....	100

#### Individual Course (Part-Time Students)

University .....	\$ 250
Technical .....	110
University Audit .....	50
Technical Audit .....	25

**Full-Time Students** are those taking three or more courses in a semester. Only full-time students pay student union, athletics, and caution deposit fees.

**Part-Time Fees** are \$250 per course for university courses (those with course numbers 100 or higher) and \$110 per course for those with course numbers below 100 to a maximum of \$880 per semester if university courses are included or \$380 per semester if no university courses are included.



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## Schedule of Payments

### Refund of Fees

Students who withdraw from the College after three weeks from the first day of classes will receive no refund of the tuition and residence room fees. Refund of the meal portion of the residence fee will be in accordance with the number of weeks remaining in the semester. The meal fees represent 40% of the residence fee.

Refunds for students who withdraw from the College prior to the completion of three weeks of classes will be as follows:

During the 1st week of classes .....	75% of tuition & room fees
During the 2nd week of classes .....	50% of tuition & room fees
During the 3rd week of classes .....	25% of tuition & room fees

Students who leave residence after three weeks from the first day of classes will receive no refund of the room portion of the residence fee. The refund for the meal portion of the residence fee will be in accordance with the number of weeks remaining in the semester.

Refunds for students who leave residence prior to the completion of three weeks of classes will be as follows:

During the 1st week of classes .....	75% of the room fee
During the 2nd week of classes .....	50% of the room fee
During the 3rd week of classes .....	25% of the room fee

The rate for room charges (shared occupancy) is 60% of the total room and board fee for the semester.

**Note:** Withdrawal from the College and/or residence is not effective until the student has completed the appropriate documentation as specified in the calendar and residence handbook and has returned to the Registrar's Office both the Student ID card and Meal Card.

Students who reserve a room in residence and fail to cancel that reservation by August 30 will be charged according to the above-noted schedule.

Student Union fees will be refunded to students who withdraw during the first week of the academic year. After the first week there will be no refund except for a withdrawal for health or other compelling compassionate reasons.

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## Schedule of Payments

### Residence Accommodations

Accommodation and meal facilities are available for male and female students. Students who have received acceptance and want to reserve a place in residence are required to pay a deposit of \$125. Returning students must pay this deposit at the time of the March room draw. New students and those returning students who do not participate in the room draw must pay the deposit at the time of admission/application for residence. The deposit will be credited to the student's accommodations and meals account. The deposit is refundable, provided notification of cancellation is received in writing as follows:

- no later than June 1 by returning students
- no later than June 30 by new students

Deposits received after June 30 are not refundable.

Trueman House, Chapman House, and Fraser House will be open as follows:

- on September 9 after 1:00 p.m. for all new students
- on September 10 after 1:00 p.m. for all other students

Any student who wishes to use residence facilities before these dates will be charged at the regular rate. Permission to arrive early must be given in writing by the office of the Dean of Students two weeks before the effective date.

### Caution and Laboratory Deposit

Every student, at the time of registration, must make a cash deposit of \$55 to cover breakage.

Damage to floors, walls, doors, windows, lighting, the sprinkler system, or furniture in any bedroom will be charged to the occupants of the room in equal shares, and damage to the common parts of the College and residences will be charged to the entire student body if the offender is not charged.

All caution deposits are subject to a general levy through the office of the Dean of Students for breakage and damage to buildings and equipment that cannot be traced. This fee, less deductions, will be refunded before the beginning of the next college year.

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## Schedule of Payments

### Health Services

An infirmary is located in Trueman House. Daily hours are maintained. General health concerns and referrals to medical doctors, dentists, and other specialists are made through the College Nurse. All students are required to provide evidence of medical/accident insurance acceptable to the College. A health card and medical plan number must be provided at the time of registration. To be acceptable the insurance must as a minimum provide coverage for prescription drugs, physiotherapy, and accidental dental.

Canadian students who do not provide evidence of acceptable insurance coverage will be required to purchase the plan recommended by the College at a cost of approximately \$75.

International students are required to have a sickness and accident coverage policy made available through the College or by another acceptable arrangement. The cost of medical accident insurance for non-Canadian students is approximately \$550.



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# Financial Aid for Students

## Canada Student Loans Plan

Eligible students enrolled in the degree and technical programs can apply for Government of Canada loans and bursaries. Application for a Certificate of Eligibility must be made to the issuing authority of the applicant's province of residence.

Under the plan, borrowers are required to repay principal and pay interest, but no payments are required as long as they are full-time students at a specified post-secondary educational institution.

Application forms are available as follows:

Nova Scotia students	Department of Education Box 2290, Station "M" Halifax, N.S. B3J 3C8
New Brunswick students	Department of Advanced Education and Training, Box 6000 Fredericton, N.B. E3B 5H1
Prince Edward Island students	Department of Education Box 1600 Charlottetown, P.E.I. C1A 7N3
Newfoundland students	Department of Education Confederation Building St. John's, Nfld. A1C 5R9

The application should be completed and filed with the issuing authority during the early summer, so that an eligibility form can be issued before Registration Day. The applicant then presents the Certificate of Eligibility at registration. Once it is signed by the Registrar, the student may take it to his or her bank to arrange for funds.

## A.F.A.C. Student Exchange Assistance

The Association of the Faculties of Agriculture in Canada (A.F.A.C.) sponsors a Student Exchange Program to assist selected students to take a year of study at a Canadian faculty of agriculture other than their home institution. The program provides \$400 for one student in the B.Sc. (Agr.) program from each of the faculties of agriculture in Canada. Credit for equivalent subjects is transferred to the home university. Students in their final year are not eligible. A letter of application must be received at the Registrar's Office, NSAC, not later than March 15 of the year in which the transfer is proposed.

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# General Information

## Programs Offered

The Nova Scotia Agricultural College was formally opened in 1905 to assume and expand the work that for several years had been carried on by the School of Horticulture in Wolfville and the School of Agriculture in Truro. The College operates under the authority of an Act of the Legislature of Nova Scotia.

A wide range of programs is offered at NSAC. In addition to a B.Sc. (Agr.), offered in association with Dalhousie University, the first three years of an Agricultural Engineering degree, the first two years of an Engineering degree, a two-year Pre-Veterinary medicine program, five technician programs, eight technology programs, and numerous vocational and continuing education courses are offered.

Students in the B.Sc. (Agr.) program select one of eight options after the completion of the first year of the program: Agribiology: Environmental Biology; Agribiology: Pest Management; Agricultural Chemistry; Agricultural Economics; Agricultural Mechanization; Animal Science; Plant Science; and Soil Science. Most students entering the program leading to a B.Sc. (Agr.) will complete their degrees at NSAC. The degree is conferred by Dalhousie University in association with the NSAC. Those who choose options not offered at the College can transfer at the end of the second year of the B.Sc. (Agr.) program, without interruption, to the Ontario Agricultural College of the University of Guelph, Macdonald College of McGill University, the University of Maine, or the faculty of agriculture at another university for the final years of the program.

Students who wish to take the two-year Pre-Veterinary Medicine program to meet the admission requirements of the Atlantic College of Veterinary Medicine at the University of Prince Edward Island will be counselled in their selection of courses.

Graduates of the NSAC Agricultural Engineering degree program are eligible for admittance to Macdonald College of McGill University or may apply to any of the other six institutions offering agricultural engineering programs for their final years of the professional engineering degree. Students completing 22 specified courses of the engineering degree program may complete their professional engineering program after a further three years in any engineering discipline at the Technical University of Nova Scotia or may apply to any other institution.

Two-year programs leading to Technician Diplomas are offered in Agricultural Business, Agricultural Engineering, Animal Science, Farm Equipment, and Plant Science. Graduates may continue their studies in a program of directed studies for a third year and earn a Diploma of Technology in Agriculture.

Two- and three-year Diploma of Technology programs are available in the areas of Animal Health, Biology, Chemistry Laboratory, Food Laboratory, Landscape Horticulture, Agriculture, Agricultural Engineering, and Farming.

Members of the NSAC faculty, who are approved by the department heads and administration, can supervise graduate students at the M.Sc. and Ph.D. level. Through the affiliation with Dalhousie University, students can obtain a graduate

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## General Information

degree in Biology. The NSAC may also host graduate students registered at other acceptable universities.

The various programs for the 1993/94 college year are listed and described in this calendar. The Faculty reserves the right to make any necessary revisions and additions.

The Faculty reserves the right to withhold any courses for which fewer than five students apply.

The Faculty will give sympathetic consideration to any student who wishes to take a special selection of courses in order to fulfil a specific need. The choice of courses will be limited to those that do not conflict when scheduled.

Students may write examinations in either of the two official languages of Canada.

## Facilities

The Nova Scotia Agricultural College is located on a 165-hectare property at Bible Hill, a kilometre northeast of Truro, Nova Scotia. The record of the College's graduates in the past 86 years is conclusive evidence that students obtain a sound agricultural education in the programs offered.

The College buildings — Cumming Hall, Harlow Institute, Banting Building, MacRae Library, Langille Athletic Centre, Collins Horticultural Building, Cox Institute of Agricultural Technology, Boulden Building, Hancock Veterinary Building, Animal Science building, MacMillan Show Centre, and a modern farm building complex — provide excellent teaching and research facilities, as well as offices and laboratories for faculty and staff, and for some of the staff of the Nova Scotia Department of Agriculture and Marketing. Fraser House, Trueman House, Chapman House, and Jenkins Hall provide excellent living and dining accommodations for male and female students.

### ***Post Office Address***

Nova Scotia Agricultural College, P.O. Box 550, Truro, N.S. B2N 5E3

### ***Telephone***

Registrar's Office: (902) 893-6722

### ***Banks and Credit Unions***

- Bank of Nova Scotia
- Bank of Montreal
- Canadian Imperial Bank of Commerce
- Royal Bank of Canada
- Toronto-Dominion Bank
- Bank of Montreal, Bible Hill
- Colchester Credit Union



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## **General Information**

### ***College Colours***

Royal Blue and Regular Gold

### ***Churches***

Churches representing a wide range of denominations are located in Truro and Bible Hill.

## **Day Care**

The Nova Scotia Agricultural College Day Care is a non-profit organization governed by a Board of Advisors appointed by the Principal. The Day Care is open five days a week from 7:30 a.m. to 6:15 p.m. It is licensed under the Department of Community Services for 33 children per day. The cost is \$17 per day or \$75 per week for children of students. The NSAC Day Care promotes quality child care.

## **Student Services**

The Dean of Student Services is responsible for all non-classroom aspects of student life from initial acceptance to graduation. This includes areas such as residence and food services, medical/counselling services, and student placement services.

## **Student Placement Service**

The Nova Scotia Agricultural College provides facilities and personnel to assist graduates and undergraduates to obtain part-time, summer, and permanent employment.

The Placement Office contacts representatives of the agricultural industry to arrange for on- and off-campus recruitment of students.

Individual counselling related to career planning and employment information associated with agriculture is available. Students are informed of employment opportunities, which are posted on bulletin boards at various locations on campus. General information on career planning, potential employers, and exchange programs is also available at the Placement Office.

## **Student Government**

Through a system of self-government, students are encouraged to accept the greatest possible degree of responsibility in connection with their own affairs. Only full-time students taking regular programs are allowed to act as executive members of the Student Union or as members of student committees.

Faculty members, appointed by the Faculty, act in an advisory capacity with student committees on financial, literary, social, and athletic affairs so that every possible benefit may be derived from these activities.



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## General Information

### Athletics

**Recreational activities.** The Langille Athletic Centre provides an opportunity for students to choose a number of activities to enjoy during their leisure time. Racquetball, squash, and badminton are very popular racquet games. The spacious weight room allows the enthusiast the use of a universal machine, three hydra machines, and free weights. Other equipment available to students for off-campus activity includes cross-country skis, golf clubs, and tennis racquets. Swimming and curling facilities are also available to students during the academic term.

**Intramural athletics.** The intramural program continues throughout the year with units of competition including soccer, softball, volleyball, hockey, basketball, badminton, table tennis, racquetball, and squash. Competition may be on a co-ed class, residence floor, or league draft system.

**Varsity athletics.** NSAC is a member of the Nova Scotia Colleges Athletic Association which includes nine colleges/universities. Conference sports for both men and women include soccer, volleyball, basketball, badminton, and cross-country running. Winners from the conference advance to the national championships administered by the Canadian Colleges Athletic Association in all the above sports except cross-country running.

Also recognized as varsity teams are men's hockey and men and women woodsmen teams. The hockey team competes in a local competitive district league. The woodsmen teams compete in tournaments throughout the year against teams from New Brunswick, Quebec, Ontario, Maine, Vermont, and New York.

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# General Regulations

All students are under the charge of the Principal and are responsible to him at all times for their conduct. The Principal is authorized to make any additional regulations found necessary for the discipline of the College and to impose fines or other penalties for any infraction of rules and regulations.

All students are expected to attend all lectures and laboratory periods in the courses for which they are registered, whether scheduled on the timetable or announced by the instructor.

Students wishing to absent themselves from classes for compassionate reasons must obtain permission from the Registrar or, in his absence, from the Dean of Student Services.

A student who arrives late for class may be refused admission.

A student may, at the discretion of the instructor, be permitted to audit a course. The privilege may be withdrawn by the instructor at any time while the course is in progress. Students who are granted auditing privileges are not permitted to write tests or examinations, or to be otherwise evaluated in the course audited.

An illness must be reported through the nurse to the Registrar's Office.

Tampering with fire protection equipment is forbidden.

Students must not destroy, deface, or meddle with College property.

Every student is expected to show, both within and outside the College, such respect for order, morality, and the rights of others, and such sense of personal honour, as is demanded of good citizens. Students found guilty of immoral, dishonest, or improper conduct, violation of rules, or failure to make satisfactory progress shall be liable to College discipline, including suspension from classes or residence, disqualification from competing for honours or prizes, or expulsion from the College.

Any form of disorderly conduct, drunkenness, or public display of intoxicating beverages is forbidden on campus and at all College functions.

Firearms that are to be kept on campus must be left at the owner's risk in the custody of the Dean of Student Services.

Students are encouraged to participate in approved College orientation activities. Hazing as a part of initiation is forbidden.

Students found in unauthorized places on campus may be subject to immediate expulsion.

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## **General Regulations**

### **Residence Regulations**

Residence Regulations are to be found in the Student Handbook, which is distributed to all students.

Students living out of residence must obey all residence rules and regulations while visiting in the residences.

Students are required to provide their own towels, soap, and drinking glasses. Sheets, pillowcases, blankets, and furniture will be provided by the College.

Students requiring accommodation for overnight visitors in a residence must obtain permission from the Dean of Student Services.

Single meals may be purchased by paying the cashier at the front end of the cafeteria line.

### **Use of Motor Vehicles**

Operation of a motor vehicle on campus by a student living in residence is a privilege that may be withdrawn at the discretion of the Principal.

### **Medical**

Each candidate who is accepted will be sent a medical form; any student who does not receive one in his or her letter of final acceptance should ask for one. At registration, new students must have their completed forms with them. If required, students must submit to further medical examinations.

Students on holiday or accepted candidates for admission who contract any contagious or infective diseases, or who reside in any dwelling in which any such diseases exist, are subject to quarantine regulations approved by the medical profession. A medical certificate is required from any student or accepted candidate for admission who has suffered from, or come in contact with, those suffering from any contagious or infective disease before he or she will be allowed to return to the College.

### **Athletic Regulations**

All students are eligible to play for teams representing the College, subject to conditions established by the NSAC, the Nova Scotia College Athletic Association, and the Canadian Colleges Athletic Association.

All teams or groups that go to any community or institution to participate in athletic activities must be accompanied by a member of the College's staff.

A student wishing to participate in athletics other than those sponsored by the College must apply in writing to, and obtain permission from, the Principal before participating either as a player or as an official.

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## **General Regulations**

Any expenses incurred through injury while playing in outside games are the responsibility of the student concerned, and not the responsibility of the Students' Medical Fund.

Students who lose time from classes due to participation in outside games will not receive an attendance credit for the time lost.



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# Summary of Academic Programs

## Agricultural Science

The Nova Scotia Agricultural College offers a complete four-year program of study leading to the degree of a Bachelor of Science in Agriculture, B.Sc. (Agr.), with a choice of eight options: Agribiology: Environmental Biology; Agribiology: Pest Management; Agricultural Chemistry; Agricultural Economics; Agricultural Mechanization; Animal Science; Plant Science; and Soil Science. Students can take other options without interruption by transferring to the third year of the B.Sc. (Agr.) program at Macdonald College of McGill University, the University of Guelph, the University of Maine, or the faculty of agriculture at another university.

## Agricultural Engineering

This diploma program allows students to study for three years at NSAC prior to completing the B.Sc. (Agr.Eng.) degree out of province. Historically students following this route have applied at Macdonald College of McGill University, or other universities where credit is given for courses taken at NSAC.

## Engineering

NSAC offers the two-year Associated Universities Professional Engineering program of the Technical University of Nova Scotia for entry into any of the engineering disciplines offered in the three-year programs at TUNS. Students who elect Agricultural Engineering at TUNS enter the co-op program, administered jointly by TUNS and NSAC, which consists of three work terms and five academic terms.

## Pre-Veterinary Medicine

A two-year program of study is offered for students who wish to apply to the Doctor of Veterinary Medicine (D.V.M.) program at the University of Prince Edward Island. The same program of study can also serve as the first two years of the B.Sc. (Agr.) program (Animal Science option).

## Technician Programs

Five two-year programs of study are offered that lead to Technician Diplomas: Agricultural Business, Agricultural Engineering, Animal Science, Farm Equipment, and Plant Science.

## Technology Programs

Eight programs are offered that lead to Diplomas of Technology.

The Agricultural Engineering Technology program is a two-year program. Only students who have completed one year of the Agricultural Engineering Technician or Farm Equipment Technician programs are considered for admission. Animal Health Technology, Biology Technology, and Food Laboratory Technology are three-year programs. The Chemistry Laboratory Technology and Landscape Horticulture Technology programs are two years in duration.

Farming Technology is a two-year program. Only students who have successfully completed one year of a specified technician program (or equivalent) are considered

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## Summary of Academic Programs

for admission. For 11 months (including summers), students in the Farming Technology program work on farms. Seven of those months consist of structured training under a farmer/instructor.

Agricultural Technology is a one-year program, tailored to meet the needs of the student. Only technician graduates are eligible to apply for this program.

### **Seminar Program**

NSAC believes that all educational programs are reinforced by exposure to current research, development, and industry issues relating to the individual's field of study. In order to provide this experience to all students, one specific class period per week has been designated as a College-wide Seminar Class. During this time, invited speakers from universities, research institutes, and industry will present topics relevant to agriculture and related disciplines. Students are expected to attend those seminars that relate directly to their areas of study and are also encouraged to attend others throughout the academic year.

### **Graduate Studies**

Graduate students wishing to study at the NSAC under the supervision of a member of the NSAC faculty must register in the Faculty of Graduate Studies, Dalhousie University, or at another acceptable university.

Applicants should consult the Dalhousie University Graduate Studies Calendar for further information. Applicants are required to notify the Registrar, NSAC, of their interest in graduate studies at NSAC.

### **Vocational Courses**

Short courses and Continuing Education courses, varying in length, are offered in a wide range of agricultural topics through the Office of Continuing Education.

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# Explanation of Terms and Codes

The courses listed in the syllabi and in the descriptions of courses are identified as to discipline and approximate academic level by letter and number codes. The disciplines are coded as follows:

Agricultural Engineering	<b>AE</b>	Economics and Business	<b>EB</b>
Animal Science	<b>AS</b>	Humanities	<b>H</b>
Biology	<b>B</b>	Mathematics and Physics	<b>MP</b>
Chemistry-Soils	<b>CS</b>	Plant Science	<b>PS</b>

Only courses with numbers of 100 or over are degree credits. Most courses with numbers between 100 and 190, inclusive, are part of the first year of the curriculum; and numbers 200 to 290 are part of the second year. Courses with numbers in the 300s and 400s are, respectively, third- and fourth-year courses. For example, B100 is a Biology course offered in the first year of the degree program curriculum. EB260 is an Economics and Business course offered in the second year of the curriculum. Both courses are credits toward a B.Sc. (Agr.) degree.

Courses with numbers between 10 and 90 are offered in one or more of the technician and/or technology programs. In general, the number indicates the level at which the subject is offered in the program of study. For example, CS12 is a Chemistry subject that is usually offered in the first year, first semester of the technician program, while PS49 is a Plant Science course that is offered in the second year, second semester of the technician programs. B25 is a Biology subject offered in the first year, second semester of the Biology Technology program.

The following definitions are important for understanding the information in the Description of Courses section.

A *prerequisite* is a course that is essential preparation for success in the course to which it is assigned. In exceptional circumstances a student may be admitted to a course, with the permission of the instructor, without having received a pass in the prerequisite.

A *corequisite* is a course that, if not taken previously, must be taken concurrently with the course to which it is assigned.

A *preparatory* is a course that will provide the student with the best background for the course to which it is assigned. Students may be admitted to a course without passing the preparatory that is assigned to it, provided that they consult first with the instructor.

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## Explanation of Terms and Codes

### Category Codes — B.Sc. (Agr.) Program

In the Description of Courses, most degree credit courses have a bracketed letter or pair of letters immediately following the name of the course. These codes indicate the discipline or category of the course. Requirements for graduation from the B.Sc. (Agr.) program include a minimum number of courses in each of these categories.

The following are the categories and their codes:

Agricultural Science	<b>A</b>	Humanities	<b>H</b>
Agricultural Engineering	<b>AE</b>	Mathematics	<b>M</b>
Economics	<b>E</b>	Science	<b>S</b>
Engineering	<b>EN</b>		



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# Challenge for Credit

Some students registering at NSAC may have acquired, through work experience and/or other forms of study, a high level of competence in areas directly related to courses offered at NSAC. The Challenge for Credit system allows these students to receive a credit in courses for which this experience can be recognized.

## Procedures

Application for Challenge for Credit is made to the Registrar.

Details regarding the application procedures for Challenge for Credit, and a list of courses for which Challenge for Credit is not available, can be obtained from the Registrar's Office.

The Department that is responsible for the course in question must be satisfied that there is a reasonable basis for requesting a Challenge for Credit, such as previous work experience or educational experience for which a credit cannot be obtained directly. The academic basis of the Department's decision is final and cannot be appealed.

The Challenge for Credit will normally be in the form of a comprehensive examination, but, for a course with an accompanying laboratory or project(s), the Department may require the demonstration of appropriate skills as a prerequisite to, or as a part of, the Challenge for Credit examination. A Challenge for Credit examination is given at the discretion of, and is administered by, the Department.

The Department and instructor concerned will determine the content and format of the Challenge for Credit examination.

A Challenge for Credit examination will be given at a time arranged by the Department, but must be completed and the grade submitted prior to the last date for adding a course for the term in which the particular course is offered.

Challenge for Credit examinations will be graded as either Pass or Fail. This grade is final and cannot be appealed. If the Challenge for Credit examination is passed, a credit for the course will be recorded on the student's transcript. Challenge for Credit examination failures will not be recorded on the student's transcript.

No student may Challenge for Credit a course in which the student has been registered, either previously or at present. This includes courses assigned a Drop/Fail (DF) or Audit status, and includes courses offered at NSAC or courses attempted elsewhere for which a credit would normally have been granted by NSAC. The latter information can be obtained from the Registrar's Office.

A student currently on Academic Probation or with a Required to Withdraw status may not Challenge for Credit.

A student may not Challenge for Credit more than once in any course.

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## **Challenge for Credit**

A total of no more than six credits may be accumulated by Challenge for Credit.

The fee schedule for Challenge for Credit is the same as that for supplemental examinations. Details may be obtained from the Registrar's Office.

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# Degree Programs

The Nova Scotia Agricultural College in association with Dalhousie University offers a four-year program leading to a degree in Agricultural Science, (B.Sc. (Agr.)) The first three years of a program leading to a degree in Agricultural Engineering, the first two years of a five-year program in various engineering disciplines, and a two-year pre-veterinary program are also offered.

Students in the B.Sc. (Agr.) program begin to specialize in their second year. They choose from a variety of options. The eight options available at NSAC are Agribiology: Environmental Biology; Agribiology: Pest Management; Agricultural Chemistry; Agricultural Economics; Agricultural Mechanization; Animal Science; Plant Science; and Soil Science. Other options, such as Biological Sciences, Food Sciences, and Renewable Resources, are available at the University of Guelph, Macdonald College of McGill University, or the University of Maine.

Students with a good academic standing who graduate from the B.Sc. (Agr.) program will usually have opportunities to take post-graduate studies through assistantships for a Master of Science or doctoral (Ph.D.) degree at faculties of agriculture in Canada and the U.S.A.

Engineering students who complete the two-year Engineering Diploma program are admitted to the third year in the engineering discipline of their choice at the Technical University of Nova Scotia. Those who elect the Agricultural Engineering discipline at TUNS enter the co-op program, which is sponsored jointly by TUNS and NSAC.

Graduates of the three-year Agricultural Engineering Diploma program may apply to Macdonald College of McGill University or to any other institution offering an Agricultural Engineering program for the final years of their professional degree.

The Pre-Veterinary Medicine program also serves as the first two years of the B.Sc. (Agr.) program, Animal Science option. For other options it may take three more years to complete the B.Sc. (Agr.) program.

NSAC students in the Agricultural Sciences who successfully complete the prescribed courses and number of credits, who make a cumulative average at or above the minimum required, and who are in good standing will be granted the degree of Bachelor of Science in Agriculture, B.Sc. (Agr.).

Students in Agricultural Engineering at NSAC who complete the prescribed courses with no marks below 50% of the maximum obtainable, who have the required cumulative grade average, and who are in good standing are granted a Diploma in Agricultural Engineering. Students in Engineering at NSAC who successfully complete the prescribed 22 courses and have the required cumulative grade average are granted an Engineering Diploma.

In Agricultural Engineering and Engineering, a high honours diploma will be awarded to a student who has attained a cumulative average of 80% or better on the work of the entire program, and an honours diploma will be awarded to a student who has attained an average of at least 75%.

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## **Degree Programs**

In the B.Sc. (Agr.) program a high honours diploma will be awarded to students with a cumulative average of 80% or over and an honours diploma to students with a minimum cumulative average of 75% and under 80%. This will apply to all graduates who have taken 20 or more courses at NSAC.

### ***Professional Organizations for Agrologists and Engineers***

Agrology is “the profession of applying science and scientific principles to the business and art of agriculture.” University graduates who are skilled in the science and business of agriculture are encouraged to join their provincial Institute of Agrology. Provincial institutes offer the opportunity to get to know and exchange ideas with other professional agrologists in the province and other parts of Canada through membership in the Agricultural Institute of Canada. Membership in the Institute of Agrology provides an element of fellowship in the profession and the opportunity to attend scientific conferences and educational tours and to receive newsletters and technical publications. Membership in an institute is required by provincial statute to practise agrology in most provinces.

The practice of engineering in Canada is governed by independent and autonomous provincial and territorial associations of professional engineers, which serve as licensing bodies for the profession. Each association has been established under a Professional Engineering Act adopted by its provincial or territorial legislature. The Canadian Council of Professional Engineers (CCPE) is the national federation of those associations of professional engineers and assists them in coordinating and standardizing their work. One such standardization is the accreditation of all engineering programs in Canada to ensure the academic content and teaching facilities are acceptable to allow graduates admission into all provincial and territorial associations.

## **Academic Standing**

All students are assessed at the end of each semester. The passing mark for individual courses is 50% unless otherwise specified. Those students with failing averages (less than 50%) or with failures in half or more of the courses in which they are registered may be required to terminate their studies.

Students who attain cumulative grade averages below the following levels, and who are not required to withdraw, will be on probation:

1 – 5 credits	50.0
6 – 10 credits	52.5
11 – 15 credits	55.0
16 – 20 credits	57.5
21 – 40 credits	60.0

Those who, in the semester following, do not raise their cumulative grade averages (CGAs) to the minimum level, or do not achieve semester grade averages (SGAs) of 60 or above, will be required to withdraw.



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## **Degree Programs**

The Cumulative Grade Average is calculated using only one grade for each course completed at NSAC. The grade used in the calculation will be the latest grade earned for the course.

The requirements for graduation include a cumulative grade average of 60 or higher at the end of the student's program. It is the student's responsibility to ensure that all the requirements for a degree are satisfied.

## **Entrance Requirements**

All candidates for admission to the program leading to a B.Sc. (Agr.) and the Pre-Vet program must present high school graduation certificates showing an average of at least 60%, with no mark below 50%, in Grade XII English, Mathematics, Chemistry, Biology or Physics, and one additional subject, all at the following provincial levels: Nova Scotia 441 (70% in Math 442 acceptable); New Brunswick 121 or 122; Prince Edward Island university preparatory). Students who are accepted but who have not successfully completed Physics at the Grade XII university preparatory level must take Physics MP90, a non-credit course, in their first year at NSAC. Possession of the minimum entrance requirements does not guarantee admission.

All candidates for admission to the Agricultural Engineering program and the Engineering program must present high school graduation certificates showing an average of at least 60%, with no mark below 50%, in Grade XII English, Mathematics, Chemistry, Physics, and one other subject, preferably Biology, all at the following provincial levels: Nova Scotia 441 (70% in Math 442 acceptable); New Brunswick 121 or 122; Prince Edward Island university preparatory. Possession of the minimum entrance requirements does not guarantee admission.

Graduates of Newfoundland Grade XII will be considered for direct entry if their average is 60% or higher in University Preparatory English, Mathematics, Chemistry, Biology or Physics, and one other subject. The Grade XII level courses for Mathematics and English must be the third full year of high school study in these subjects, and for Chemistry and Biology or Physics the second full year. Possession of the minimum entrance requirements does not guarantee admission.

## **Supplemental Examinations**

A student may write one supplemental examination in each failed subject in which the mark is 40% to 49%. Supplemental examinations are written in the late June supplemental exam period immediately following the failure. A student in the final year may write one supplemental examination in the Winter Semester, if passing that examination and all final semester examinations makes the student eligible for graduation.

No student in any degree or technical program is permitted to write more than six supplemental exams.

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## Degree Programs

Students apply to write a supplemental examination or examinations by notifying the Registrar's Office of the subject or subjects they intend to write, and by submitting to the Registrar's Office the supplemental examination fee of \$100 per exam. A passing grade in the supplemental examination will result in a \$50 refund.

No supplemental examination is to be written until the required fee has been paid. If a student does not show up to write a supplemental examination, the fee is forfeited. Should a candidate for a supplemental examination not give notice or pay the required fee on time, but arrive to write an examination, permission to write may be granted at the discretion of the Registrar and the instructor, and upon payment of \$100 per examination. There is no refund for this case.

### **Bachelor of Science in Agriculture—B.Sc. (Agr.)**

The B.Sc. (Agr.) is a four-year program, designed to provide a sound education in the science of agriculture. Graduates of this course meet the formal educational requirements for professional agrologists in the provincial Institutes of Agrologists in the Atlantic Provinces.

The first academic year (two semesters) of this program is the same for all options. Normally, students select one of the options before the commencement of the third semester and continue in that major field of study until they graduate. Options offered at NSAC are:

- Agribiology: Environmental Biology
- Agribiology: Pest Management
- Agricultural Chemistry
- Agricultural Economics
- Agricultural Mechanization
- Animal Science
- Plant Science
- Soil Science

#### ***Minimum Requirements***

Academic requirements for the Bachelor of Science degree in Agriculture consist of successful completion of:

- all courses as specified in the syllabus
- not less than 12 semester courses in Agricultural Science or Agricultural Engineering
- not less than 6 semester courses in Basic Sciences
- not less than 6 semester courses in Humanities and Economics (one Humanities course must be at the 300 level)
- at least 40 semester courses
- at least 15 courses at NSAC, plus registration in the final year at NSAC
- courses with numbers of 100 or higher as degree credits

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## Degree Programs

The minimum level of academic achievement to graduate is a cumulative grade average of 60%.

It is the student's responsibility to see that the requirements for the awarding of the B.Sc. (Agr.) are fulfilled.

### ***Bachelor of Science in Agriculture***

#### ***Syllabus***

#### ***Year 1—All Options***

##### ***Semester I***

B100 Botany  
CS100 Chemical Principles  
H100 Technical Writing/  
English and American Authors  
MP100 Calculus and Analytic  
Geometry I  
PS100 Principles of Crop Production

##### ***Semester II***

AS100 Introductory Animal Science  
B110 Zoology  
CS110 Organic Chemistry  
EB110 Agricultural Economics  
MP105 Calculus and Analytic  
Geometry II

The first academic year is the same regardless of which option a student intends to follow. By the time first-year students reach the middle of the Winter Semester (early March), they select one of the eight options listed on the following pages.

# Degree Programs

## *Bachelor of Science in Agriculture*

### *Years 2, 3 and 4—Agribiology: Environmental Biology*

#### **Semester III**

B200 Cell Biology  
B265 Systematic Botany  
CS200 Biochemistry I  
CS220 Introduction to Soil Science  
MP130 Physics for Life Sciences I

#### **Semester V**

AE150 Engineering in Agriculture  
AS300 Animal Physiology  
B330 Ecology  
B360 Environmental Analysis  
B385 Principles of Pest Management

#### **Semester VII**

B240 Genetics I  
B400 Soil Microbiology  
B449 Project-Seminar I  
*Elective*  
*Elective*

#### **Semester IV**

B225 Microbiology  
B260 Plant Physiology  
B270 Structural Botany  
CS205 Biochemistry II  
MP200 Statistics

#### **Semester VI**

B350 Ecological Methods  
B365 Environmental Impact  
H205 Canadian Studies  
MP222 Computer Methods  
*Elective*

#### **Semester VIII**

B430 Ecology of Agriculture  
B450 Project-Seminar II  
EB355 Macroeconomics I  
*Elective*  
*Elective*

*Electives must include one of either H320, H325, or H350; one additional Humanities or Economics course; and two additional Agricultural Science courses.*

#### **Recommended Electives:**

AE330 Hydrology  
AE340 Soil and Water  
B405 Pesticides in Agriculture  
CS320 Soil Fertility  
CS340 Soil Chemistry  
MP320 Statistical Methods  
MP330 Agrometeorology



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## Degree Programs

### *Years 2, 3 and 4—Agronomy: Pest Management*

#### **Semester III**

B200 Cell Biology  
B265 Systematic Botany  
CS200 Biochemistry I  
CS220 Introduction to Soil Science  
MP130 Physics for Life Sciences I

#### **Semester V**

AE150 Engineering in Agriculture  
B300 Principles of Plant Pathology  
B310 Mycology  
B320 General Entomology  
B335 Weed Science

#### **Semester VII**

B240 Genetics I  
B330 Ecology  
B449 Project-Seminar I  
*Elective*  
*Elective*

#### **Semester IV**

B225 Microbiology  
B260 Plant Physiology  
B270 Structural Botany  
CS205 Biochemistry II  
MP200 Statistics

#### **Semester VI**

B305 Economic Plant Pathology  
B325 Economic Entomology  
B345 Applied Weed Science  
MP222 Computer Methods  
*Elective*

#### **Semester VIII**

B450 Project-Seminar II  
EB355 Macroeconomics I  
H205 Canadian Studies  
*Elective*  
*Elective*

*Electives must include one of either H320, or H325, or H350; one additional Humanities or Economics course; and one of either B400 Soil Microbiology, B405 Pesticides in Agriculture, or B430 Ecology of Agriculture.*

#### **Recommended Electives:**

MP320 Statistical Methods  
MP330 Agrometeorology  
PS350 Plant Biochemistry

# Degree Programs

## Year 2, 3 and 4—Agricultural Chemistry

### Semester III

- AE150 Engineering in Agriculture
- CS200 Biochemistry I
- CS210 Advanced General Chemistry<sup>1</sup>  
or CS215 Advanced Organic  
Chemistry<sup>1</sup>
- CS220 Introduction to Soil Science
- MP130 Physics for Life Sciences I

### Semester V

- CS210 Advanced General Chemistry<sup>1</sup>  
or CS215 Advanced Organic  
Chemistry<sup>1</sup>
- CS300 Physical Chemistry I<sup>1</sup> or  
*Elective*
- CS305 Instrumental Analytical  
Chemistry  
*Elective*  
*Elective*

### Semester VII

- CS300 Physical Chemistry I<sup>1</sup> or  
*Elective*
- CS449 Project-Seminar I  
*Elective*  
*Elective*  
*Elective*

### Semester IV

- CS205 Biochemistry II
- CS225 Quantitative Analytical  
Chemistry
- H205 Canadian Studies
- MP200 Statistics
- MP222 Computer Methods

### Semester VI

- B225 Microbiology
- CS310 Radiotracers in Agriculture
- CS340 Soil Chemistry<sup>1</sup> or *Elective*
- CS350 Food Chemistry  
*Elective*

### Semester VIII

- CS340 Soil Chemistry<sup>1</sup> or *Elective*
- CS370 Instrumental Food Analysis
- CS450 Project-Seminar II
- EB355 Macroeconomics I  
*Elective*

<sup>1</sup>These courses will be taken in alternate years and are required for the option.

*Electives must include one Humanities course at the 300 level plus one more Humanities or Economics course and three Agriculture courses.*

### Recommended Electives:

#### Fall Semester

- AS300 Animal Physiology
- AS305 Animal Nutrition
- B330 Ecology
- B400 Soil Microbiology
- CS415 Special Topics in Chemistry  
and Soil Science
- CS420 Organic Environmental  
Chemistry
- EB340 Farm Management I
- H400 Issues in Agriculture
- PS305 Grain Production

#### Winter Semester

- B260 Plant Physiology
- CS230 Introduction to Geology
- CS320 Soil Fertility
- CS360 Mammalian Biochemistry
- H325 Technology in Agricultural  
Communications
- PS300 Forage Crops

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# Degree Programs

## *Years 2, 3 and 4—Agricultural Economics*

### **Semester III**

CS220 Introduction to Soil Science  
EB200 Microeconomics I  
EB210 Financial Accounting I  
EB260 Mathematical Economics  
MP222 Computer Methods

### **Semester V**

EB310 Cost Accounting  
EB335 Business Marketing  
EB340 Farm Management I  
EB360 Econometrics  
*Elective*  
*Elective*

### **Semester VII**

EB400 Resource and Environmental  
Economics  
EB415 Business Law  
EB425 Research Methods  
*Elective*  
*Elective*

### **Semester IV**

EB205 Microeconomics II  
EB215 Financial Accounting II  
H205 Canadian Studies  
MP200 Statistics  
*Elective*

### **Semester VI**

EB325 Operations Research  
EB330 Agricultural Markets and  
Prices  
EB355 Macroeconomics I  
*Elective*

### **Semester VIII**

EB405 Macroeconomics II  
EB420 Agricultural and Food Policy  
EB440 Farm Management II  
EB450 Project-Seminar  
*Elective*

*Electives must include two science courses, one of which must be Physics, and one course from each of Agricultural Engineering, Animal Science, Plant Science, and one Humanities course at the 300 level.*

# Degree Programs

## Year 2, 3 and 4 — Agricultural Mechanization

### **Semester III**

AE100 Graphics and Projection  
AE150 Engineering in Agriculture  
CS220 Introduction to Soil Science  
EB210 Financial Accounting I  
MP130 Physics for Life Sciences I

### **Semester V**

AE231 Agricultural Machinery  
AE305 Engineering Measurements  
and Controls  
AE320 Agricultural Structures  
AE335 Materials Handling and  
Processing  
*Elective*

### **Semester VII**

AE340 Soil and Water  
AE450 Project-Seminar II  
EB340 Farm Management I  
*Elective*  
*Elective*  
*Elective*  
*Elective*

### **Semester IV**

AE110 Statics  
H205 Canadian Studies  
MP135 Physics for Life Sciences II  
MP200 Statistics  
MP222 Computer Methods

### **Semester VI**

AE325 Agricultural Tractors  
AE345 Energy in Agriculture  
or AE400 Agricultural  
Mechanization Systems  
AE449 Project-Seminar I  
EB355 Macroeconomics I  
*Elective*

### **Semester VIII**

AE330 Hydrology  
AE345 Energy in Agriculture or  
AE400 Agricultural  
Mechanization Systems  
*Elective*

*Electives must include a Humanities course at the 300 level.*



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## Degree Programs

### *Year 2, 3 and 4—Animal Science*

#### **Semester III**

B200 Cell Biology  
B240 Genetics I  
CS200 Biochemistry I  
CS220 Introduction to Soil Science  
MP130 Physics for Life Sciences I

#### **Semester V**

AE150 Engineering in Agriculture  
AS300 Animal Physiology  
AS305 Animal Nutrition  
AS310 Animal Breeding  
*Elective*

#### **Semester VII**

AS449 Project-Seminar I  
*Elective*  
*Elective*  
*Elective*  
*Elective*

#### **Semester IV**

B225 Microbiology  
B245 Genetics II  
CS205 Biochemistry II  
H205 Canadian Studies  
MP200 Statistics

#### **Semester VI**

AS315 Reproductive Physiology  
AS320 Animal Health  
AS325 Applied Animal Nutrition  
EB355 Macroeconomics I  
*Elective*

#### **Semester VIII**

AS450 Project-Seminar II  
*Elective*  
*Elective*  
*Elective*  
*Elective*

*Electives must include three Animal Production courses, one Humanities course at the 300 level and one more Humanities or Economics course.*

# Degree Programs

## *Years 2, 3 and 4—Plant Science*

### **Semester III**

B200 Cell Biology  
B240 Genetics I  
B265 Systematic Botany  
CS200 Biochemistry I  
MP130 Physics for Life Sciences I

### **Semester V**

B300 Principles of Plant Pathology  
B320 General Entomology  
B335 Weed Science  
CS220 Introduction to Soil Science  
*Elective*

### **Semester VII**

PS415 Crop Adaptation  
PS450 Project-Seminar II  
*Elective*  
*Elective*  
*Elective*

### **Semester IV**

B260 Plant Physiology  
H205 Canadian Studies  
MP200 Statistics  
*Elective*  
*Elective*

### **Semester VI**

CS320 Soil Fertility  
PS449 Project-Seminar I  
*Elective*  
*Elective*  
*Elective*

### **Semester VIII**

EB355 Macroeconomics I  
PS405 Agronomy or  
PS410 Horticulture  
*Elective*  
*Elective*  
*Elective*

*Electives must include AE150 Engineering in Agriculture, three crop production courses, one Humanities course at the 300 level, and one additional Humanity or Economics course. It is recommended that at least one crop production elective be taken before the end of Semester IV. Agronomy majors must include PS305 in Semester V and PS300 in Semester VII.*

### **Recommended Electives:**

B245 Genetics II  
CS205 Biochemistry II  
EB340 Farm Management I  
MP222 Computer Methods  
MP330 Agrometeorology  
PS350 Plant Biochemistry  
PS400 Plant Breeding

# Degree Programs

## Year 2, 3 and 4—Soil Science

### Semester III

AE150 Engineering in Agriculture  
CS200 Biochemistry I  
CS220 Introduction to Soil Science  
MP130 Physics for Life Sciences I  
*Elective*

### Semester IV

B225 Microbiology  
B260 Plant Physiology  
CS225 Quantitative Analytical  
Chemistry  
MP200 Statistics  
MP222 Computer Methods

### Semester V

B330 Ecology  
CS305 Instrumental Analytical  
Chemistry  
CS325 Soil Genesis and Classification<sup>1</sup>  
or CS430 Soil Survey and Land  
Evaluation<sup>1</sup>  
*Elective*  
*Elective*

### Semester VI

CS230 Introduction to Geology  
CS320 Soil Fertility  
CS335 Soil Physics<sup>1</sup> or CS340 Soil  
Chemistry<sup>1</sup>  
H205 Canadian Studies  
*Elective*

### Semester VII

AE340 Soil and Water  
B400 Soil Microbiology  
CS325 Soil Genesis and Classification<sup>1</sup>  
or CS430 Soil Survey and Land  
Evaluation<sup>1</sup>  
CS449 Project-Seminar I  
*Elective*

### Semester VIII

CS335 Soil Physics<sup>1</sup> or CS340 Soil  
Chemistry<sup>1</sup>  
CS450 Project-Seminar II  
EB355 Macroeconomics I  
*Elective*  
*Elective*

*Electives must include one Humanities at the 300 level and one more Humanities or Economics course.*

<sup>1</sup>*These courses will be offered in alternate years.*

## Recommended Electives:

### Fall Semester

B300 Plant Pathology  
B320 Entomology  
B335 Weed Science  
CS345 Soil Conservation in  
Agriculture  
CS415 Special Topics in Chemistry  
and Soil Science  
H120 Rural Sociology  
H305 History of Scientific and  
Agricultural Thought  
PS147 Farm Woodlot Management  
PS305 Grain Production  
PS310 Vegetable Crops

### Winter Semester

AE345 Energy in Agriculture  
CS205 Biochemistry II  
CS310 Radiotracers in Agriculture  
CS415 Special Topics in Chemistry  
and Soil Science  
H300 History of Agriculture  
H325 Technology in Agricultural  
Communications  
MP330 Agrometeorology  
PS300 Forage Crops  
PS415 Crop Adaptation

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## **Degree Programs**

### **Agricultural Engineering in Atlantic Canada—B. Eng.**

Agricultural Engineering is one of the engineering disciplines offered at the Technical University of Nova Scotia. An agreement between TUNS and NSAC has been approved whereby the Agricultural Engineering program will be taught jointly by the two institutions. This cooperative program with its three work terms and five academic terms (following completion of the Associated University program) will have term 10 taught at NSAC, while all other academic terms are completed at TUNS.

Graduates of this program will meet the formal education requirements for admission to the provincial Associations of Professional Engineers and the provincial Institutes of Agrologists.

### **Agricultural Engineering Diploma**

The B.Sc. (Agr.Eng.) degree program is a professional engineering program, the first three years of which are offered at NSAC. Students who successfully complete the program at NSAC are graduates of NSAC and receive an Agricultural Engineering Diploma. Credit is given for courses taken at NSAC as determined by the receiving university, and residency requirements of that university may determine the number of courses required to complete the degree.

These students then proceed for their final years of the B.Sc. (Agr.Eng.) program to Macdonald College of McGill University or other institutions with agricultural engineering programs.

Graduates of the complete B.Sc. (Agr.Eng.) program meet the formal educational requirements for admission to the provincial Associations of Professional Engineers and the provincial Institutes of Agrologists.

#### ***Requirements***

The academic requirements for the Agricultural Engineering Diploma are successful completion of:

- all courses as specified in the syllabus of courses
- at least 32 semester courses
- at least 15 courses at NSAC, plus registration in the final year at NSAC.

The minimum level of academic achievement to graduate is a cumulative average of 60%.



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## Degree Programs

### Engineering Diploma

The Engineering Diploma program is the 22-course Associated University program given in conjunction with the Technical University of Nova Scotia. Students who successfully complete this program at NSAC receive an Engineering Diploma.

Graduates are accepted by TUNS without examination into the third year of a five-year program in any of the engineering departments, or in the Departments of Computer Science or Architecture.

This B.Eng. program leads to recognition by the provincial Associations of Professional Engineers.

#### **Requirements**

The academic requirements for the Engineering Diploma are successful completion of:

- all courses specified in the syllabus of courses
- at least 22 semester courses
- at least 11 courses at NSAC plus registration in the final year at NSAC

The minimum level of academic achievement to graduate is a cumulative average of 60%.

### **Agricultural Engineering Diploma**

#### **Syllabus**

##### **Year 1**

##### **Semester I**

AE100	Graphics and Projection
CS100	Chemical Principles
H100	Technical Writing/ English and American Authors
MP100	Calculus and Analytic Geometry I
MP130	Physics for Life Sciences I

##### **Semester II**

AE110	Statics
CS110	Organic Chemistry
EB110	Agricultural Economics
MP105	Calculus and Analytic Geometry II
MP135	Physics for Life Sciences II

# Degree Programs

## *Spring Session*

**AE260 Surveying – 2 weeks**

## *Year 2*

### **Semester III**

AE220 Dynamics I  
AE231 Agricultural Machinery  
CS220 Introduction to Soil Science  
MP220 Computer Science  
MP230 Multivariable Calculus  
PS100 Principles of Crop Production

### **Semester IV**

AE205 Graphics and Design  
AE225 Dynamics II  
AS100 Introductory Animal Science  
MP200 Statistics  
MP235 Differential Equations and Linear Algebra

## *Year 3*

### **Semester V**

AE310 Thermodynamics  
AE340 Soil and Water  
MP300 Electric Circuits  
*Elective*<sup>1</sup>  
*Humanities Elective*<sup>2</sup>

### **Semester VI**

AE315 Strength of Materials  
AE320 Agricultural Structures  
AE350 Fluid Mechanics  
*Elective*<sup>1</sup>  
*Humanities Elective*<sup>2</sup>

<sup>1</sup>*One elective must be an Agricultural Engineering course.*

<sup>2</sup>*One humanities elective must be at the 300 level.*

## **Engineering Diploma**

### **Syllabus**

## *Year 1*

### **Semester I**

AE100 Graphics and Projection  
CS100 Chemical Principles  
H100 Technical Writing/  
English and American Authors  
MP100 Calculus and Analytic  
Geometry I  
MP130 Physics for Life Sciences I

### **Semester II**

AE110 Statics  
CS110 Organic Chemistry  
EB110 Agricultural Economics<sup>1</sup>  
MP105 Calculus and Analytic  
Geometry II  
MP135 Physics for Life Sciences II

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## Degree Programs

### Year 2

#### **Semester III**

AE220	Dynamics I
AE310	Thermodynamics
MP220	Computer Science
MP230	Multivariable Calculus
MP300	Electric Circuits
H120	Rural Sociology <sup>2</sup>

#### **Semester IV**

AE205	Graphics and Design
AE225	Dynamics II
AE315	Strength of Materials
AE350	Fluid Mechanics
H150	Agriculture Today <sup>3</sup>
MP235	Differential Equations and Linear Algebra

<sup>1</sup>May substitute H150 Agriculture Today, or H140 Personnel Management if timetable permits.

<sup>2</sup>May substitute H320 Extension Education in the Rural Community if timetable permits.

<sup>3</sup>May substitute H140 Personnel Management, H325 Technology in Agricultural Communications, or H126 Sustainable Rural Communities if timetable permits.

## Pre-Veterinary Medicine

Students prepare to enter the program leading to Doctor of Veterinary Medicine at the University of Prince Edward Island by completing a two-year program at NSAC.

### Syllabus

#### Year 1

##### **Semester I**

B100	Botany
CS100	Chemical Principles
H100	Technical Writing/ English and American Authors
MP100	Calculus and Analytic Geometry I <i>Elective</i> <sup>1</sup>

##### **Semester II**

B110	Zoology
CS110	Organic Chemistry
EB110	Agricultural Economics <sup>1</sup> <i>Elective</i> <sup>1</sup> <i>Elective</i> <sup>1</sup>

#### Year 2

##### **Semester III**

B240	Genetics I
CS200	Biochemistry I
MP130	Physics for Life Sciences I <i>Elective</i> <sup>1</sup> <i>Elective</i> <sup>1</sup>

##### **Semester IV**

B225	Microbiology
H205	Canadian Studies
MP200	Statistics <i>Elective</i> <sup>1</sup> <i>Elective</i> <sup>1</sup>

<sup>1</sup>The number of Humanities and Social Science courses must not be fewer than three.

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# Technician Programs

To satisfy the needs of the farm and farm-related businesses and services, the Nova Scotia Agricultural College offers a broad program of studies leading to Technician Diplomas.

## Pre-Tech Semester

The Nova Scotia Agricultural College offers a Winter Semester program designed to prepare high school graduates for entrance to the technician programs.

Candidates may be considered who lack specific subject entrance requirements for the technician programs in up to three subjects. All applicants with academic admission requirements must present themselves for a selection interview when invited. The following is the syllabus of courses for the Pre-Tech semester:

B01	Pre-Tech Biology
CS01	Pre-Tech Chemistry
EB01	The Agricultural Industry
H01	Language Development
MP01	Pre-Tech Mathematics

All students accepted for this Pre-Tech semester must take at least four of these courses.

Upon satisfactory completion of the semester, a student may be granted acceptance into one of the programs leading to a Technician Diploma.

## Entrance Requirements

All candidates for admission to the technician programs must:

- be 18 years of age on or before the opening day of the College year (mature younger candidates will be considered)
- produce evidence of senior high school graduation with three university preparatory courses in English, two in Mathematics, one in Chemistry, and one in Biology, or satisfactory completion of the Pre-Tech semester
- present themselves for a selection interview when required

Candidates of mature age and from different academic backgrounds may apply and request to have their academic records evaluated for admission.

Candidates with at least 60% in a senior high school course in Physics will be exempt from MP15, Introductory Physics.

Possession of the minimum entrance requirement does not guarantee admission.



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## Technician Programs

### Academic Standing

All students are assessed at the end of each semester. Those with failing averages (less than 50%) or failures in half or more of the courses in which they are registered may be required to terminate their studies.

Students who complete all the program requirements with no mark below 50% of the maximum mark obtainable and who are in good standing will be awarded Technician Diplomas, and thus become “Associates of the Nova Scotia Agricultural College with all the rights and privileges pertaining thereto.” It is the student’s responsibility to ensure that all the requirements for a diploma are satisfied.

A high honours diploma will be awarded to a student who has attained an average of at least 80%, and an honours diploma will be awarded to one who has attained an average of at least 75%.

It is the student’s responsibility to see that the requirements for a diploma are fulfilled.

### Supplemental Examinations

A student in a technician program may write a supplemental examination during the June supplementary examination period immediately following the failure of a course with a mark of 40% to 49%. A student is permitted to write a maximum of six supplemental exams over the duration of any program of study.

A student in the final year may write one supplemental examination in the Winter Semester if passing that examination and all final semester examinations makes the student eligible for graduation.

The fee for a supplemental examination in any course is \$100. If a student does not write the supplemental examination, the fee is forfeited. Successful completion will result in a \$50 refund. A candidate for a supplemental examination who does not give notice and pay the required fee on time, but arrives for an examination, may, at the discretion of the Registrar and the instructor and upon payment of a fee of \$100 per examination, be permitted to write. There will be no refund in this case.

### Agricultural Colleges Exchange Program

This program provides an opportunity for technical students in several of the programs to enroll in another Canadian college for one semester of their second academic year. In this way they broaden their study program.

Other colleges participating with NSAC in this program are:

- The Ontario Agricultural College, University of Guelph, Guelph, Ontario
- Olds College, Olds, Alberta
- Lakeland College, Vermilion Campus, Vermilion, Alberta

For more detailed information contact the Dean of Vocational and Technical Education at NSAC.

# Technician Programs

## Agricultural Business

This two-year program prepares students for careers on the farm as business managers or as managers and supervisors in farm-related business firms.

### Academic Entrance Requirements

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required.

### Syllabus

#### Agricultural Business with minor in

##### Animal Science

##### Plant Science

##### Agricultural Engineering

#### Year 1

#### Semester I

CS12	Principles of Soil Science	CS12	Principles of Soil Science	AE12	Drafting
CS14	Agr. Chemistry	CS14	Agr. Chemistry	CS12	Principles of Soil Science
EB10	Accounting	EB10	Accounting	CS14	Agr. Chemistry
EB12	Macroeconomics	EB12	Macroeconomics	EB10	Accounting
H10	Tech. Writing	H10	Tech. Writing	EB12	Macroeconomics
PS40	Field Crops I	PS40	Field Crops I	H10	Tech. Writing

*An additional course, AS29 Farm Practices, is optional for all students.*

#### Semester II

CS13	Soil Management	AS30	Animal Science	AS30	Animal Science
EB11	App. Acct. & Taxation	CS13	Soil Management	CS13	Soil Management
EB13	Microeconomics	EB11	App. Acct. & Taxation	EB11	App. Acct. & Taxation
EB41	Business Law	EB13	Microeconomics	EB13	Microeconomics
MP14	Computational Methods	MP14	Computational Methods	MP14	Computational Methods
PS41	Field Crops II	PS41	Field Crops II		<i>Humanities Elective</i>

# Technician Programs

## *Agricultural Business with minor in*

### ***Animal Science***

### ***Plant Science***

### ***Agricultural Engineering***

#### ***Year 2***

#### ***Semester III***

AS20	Farm Animal Breeding	B43	Entomology	AE30	Farm Machinery <sup>3</sup>
		EB40	Marketing Practices	EB40	Marketing Practices
AS34	Animal Nutrition				
B20	Animal Physiology	EB65	Business Project Farm	EB65	Business Project Farm
EB40	Marketing Practices	EB340	Management I	EB340	Management I
EB65	Business Project	PS53	Vegetable Production <sup>2</sup>	MP15	Introductory Physics
EB340	Farm Management I		<i>Humanities Elective</i>	PS40	Field Crops I

#### ***Semester IV***

AS35	Feeds & Feeding	B40	Plant Pathology	AE34	Farm Tractors <sup>3</sup>
AS50	Dairy Production <sup>1</sup>	EB41	Business Law	AE38	Horticultural Engineering
AS51	Beef & Sheep Production <sup>1</sup>	EB42	Applied Farm Management	EB41	Business Law
EB42	Applied Farm Management	EB220	Production Economics	EB42	Applied Farm Management
EB220	Production Economics	PS49	Potato Production <sup>2</sup>	EB220	Production Economics
	<i>Humanities Elective</i>	PS76	Plant Products Physiology	PS41	Field Crops II

<sup>1</sup>May substitute another Animal Production course if timetable permits.

<sup>2</sup>May substitute PS43 Small Fruit Crops (Semester III) and PS44 Tree Fruit Crops (Semester IV) if timetable permits.

<sup>3</sup>May substitute AE32 Farm Buildings or AE36 Controls and Processing if timetable permits.

A student who has successfully completed the first year of this program with a good study record may apply for acceptance into a two-year program in Farming Technology. A student who has successfully completed the two years with a good study record may apply for acceptance into a one-year program in Agricultural Technology.

# Technician Programs

## Agricultural Engineering

The Nova Scotia Agricultural College offers a two-year program to prepare students for careers on farms or in farm-related firms with specialization in the efficient use and maintenance of land, structures, and machinery.

### **Academic Entrance Requirements**

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required.

### **Syllabus**

#### **Year 1**

##### **Semester I**

AE12 Drafting  
AE13 Shopwork  
AE14 Surveying  
CS12 Principles of Soil Science  
H10 Technical Writing  
MP15 Introductory Physics

##### **Semester II**

AE19 Technical Drawing  
AE20 Shopwork Practices  
AE27 Welding  
MP14 Computational Methods  
PS30 Introduction to Plant Science  
*Elective*

#### **Year 2**

##### **Semester III**

AE30 Farm Machinery  
AE32 Farm Buildings  
AE45 Soil and Water  
Management  
AE49 Electrical Systems  
AE63 Tractor Power  
EB10 Accounting

##### **Semester IV**

AE36 Controls & Processing  
AE65 Project-Seminar  
AS30 Animal Science  
*Humanities Elective*  
*Elective*  
*Elective*

*At least one of the electives must be an AE course.*

A student who has successfully completed the first year of this program with a good study record may apply for acceptance into a two-year program in Farming Technology or Agricultural Engineering Technology. A student who has successfully completed the two years of Agricultural Engineering with a good study record may apply for acceptance into a one-year program in Agricultural Technology.



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# Technician Programs

## Animal Science

The Nova Scotia Agricultural College offers a two-year program in Animal Science to prepare students for careers on farms as animal specialists or as animal science technicians in farm-related services and industries.

### **Academic Entrance Requirements**

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required.

### **Syllabus**

#### **Animal Science with minor in**

##### **Agricultural Business**

##### **Agricultural Engineering**

#### **Year 1**

##### **Semester I**

AS20 Farm Animal Breeding  
AS34 Animal Nutrition  
B20 Animal Physiology  
CS12 Principles of Soil Science  
CS14 Agricultural Chemistry  
H10 Technical Writing

AS20 Farm Animal Breeding  
AS34 Animal Nutrition  
B20 Animal Physiology  
CS12 Principles of Soil Science  
CS14 Agricultural Chemistry  
H10 Technical Writing

*An additional course, AS29 Farm Practices, is required of all students.*

##### **Semester II**

AS33 Applied Animal Physiology  
AS35 Feeds & Feeding  
CS13 Soil Management  
EB41 Business Law  
MP14 Computational Methods  
*Humanities Elective*

AE15 Oil Hydraulics<sup>1</sup>  
AS33 Applied Animal Physiology  
AS35 Feeds & Feeding  
CS13 Soil Management  
MP14 Computational Methods  
*Humanities Elective*

# Technician Programs

## *Animal Science with minor in*

### *Agricultural Business*

#### *Year 2*

##### ***Semester III***

AS47	Animal Health
AS53	Poultry Production <sup>2</sup>
AS65	Project-Seminar
EB10	Accounting
EB340	Farm Management I
PS40	Field Crops I

##### ***Semester IV***

AS50	Dairy Production <sup>2</sup>
AS51	Beef & Sheep Production <sup>2</sup>
AS52	Swine Production <sup>2</sup>
AS55	Fur Production <sup>2</sup>
EB11	Applied Accounting and Taxation
PS41	Field Crops II

### *Agricultural Engineering*

AE30	Farm Machinery <sup>1</sup>
AS47	Animal Health
AS53	Poultry Production <sup>2</sup>
AS65	Project-Seminar
MP15	Introductory Physics
PS40	Field Crops I

AE34	Farm Tractors <sup>1</sup>
AS50	Dairy Production <sup>2</sup>
AS51	Beef & Sheep Production <sup>2</sup>
AS52	Swine Production <sup>2</sup>
AS55	Fur Production <sup>2</sup>
PS41	Field Crops II

<sup>1</sup>May substitute AE12 Drafting, AE32 Farm Buildings, or AE36 Controls and Processing if timetable permits.

<sup>2</sup>May substitute AS37 Laboratory Animal Care I or AS240 The Horse: Its Biology and Use if timetable permits.

A student who has successfully completed the first year of this program with a good study record may apply for acceptance into a two-year program in Farming Technology. A student who has successfully completed the second year with a good study record may apply for acceptance into a one-year program in Agricultural Technology.

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## Technician Programs

### Farm Equipment

The Nova Scotia Agricultural College offers a two-year program to prepare students for careers in farm equipment dealerships involving the adjustment, maintenance, and repair of farm equipment.

#### **Academic Entrance Requirements**

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required.

#### **Syllabus**

##### **Year 1**

###### **Semester I**

AE12 Drafting  
AE13 Shopwork  
CS14 Agricultural Chemistry  
EB10 Accounting  
H10 Technical Writing  
MP15 Introductory Physics

###### **Semester II**

AE15 Oil Hydraulics  
AE20 Shopwork Practices  
AE27 Welding  
EB11 Applied Acct. & Taxation  
EB41 Business Law  
MP14 Computational Methods

###### **Spring Session**

AE23 Farm Equipment Dealership – 6 weeks

##### **Year 2**

###### **Semester III**

AE30 Farm Machinery  
AE48 Shop Management  
AE49 Electrical Systems  
AE63 Tractor Power  
CS12 Principles of Soil Science  
PS10 Plant Production Practices

###### **Semester IV**

AE39 Tractor Overhaul  
AE40 Field Equipment Overhaul  
AE65 Project-Seminar  
AE68 Farmstead Equipment Overhaul  
AS30 Animal Science  
*Humanities Elective*

# Technician Programs

## Plant Science

The Nova Scotia Agricultural College offers a two-year program in Plant Science to prepare students for careers on farms as plant specialists or as plant science technicians in agronomy, horticulture, or ornamental horticulture services and industries.

### *Academic Entrance Requirements*

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required.

### *Syllabus*

#### *Plant Science with specialization in*

<i>Agronomy</i>	<i>Horticulture</i>	<i>Ornamental Horticulture</i>
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#### *Year 1*

##### *Semester I*

B43	Entomology	B43	Entomology	B43	Entomology
CS12	Principles of Soil Science	CS12	Principles of Soil Science	CS12	Principles of Soil Science
EB10	Accounting	EB10	Accounting	EB10	Accounting
H10	Tech. Writing	H10	Tech. Writing	H10	Tech. Writing
PS10	Plant Production Practices	PS10	Plant Production Practices	PS10	Plant Production Practices
PS55	Plant Propagation	PS55	Plant Propagation	PS55	Plant Propagation

##### *Semester II*

AS30	Animal Science	AE38	Horticultural Engineering	AE38	Horticultural Engineering
B41	Plant Physiology	B41	Plant Physiology	B41	Plant Physiology
B46	Weed Science	B46	Weed Science	B46	Weed Science
CS13	Soil Management	CS13	Soil Management	CS13	Soil Management
MP14	Computational Methods	MP14	Computational Methods	MP14	Computational Methods
PS30	Introduction to Plant Science	PS30	Introduction to Plant Science	PS38	Nursery Crop Production



# Technician Programs

## *Plant Science with specialization in*

<i>Agronomy</i>		<i>Horticulture</i>		<i>Ornamental Horticulture</i>	
<b>Year 2</b>					
<b>Semester III</b>					
AE30	Farm Machinery	MP15	Introductory	PS39	Greenhouse Crop Management
AS34	Animal Nutrition <sup>1</sup>		Physics		
EB340	Farm Management I	PS39	Greenhouse Crop Management	PS43	Small Fruit Crops
MP15	Introductory Physics	PS40	Field Crops I	PS47	Turfgrass Production and Management <sup>1</sup>
PS40	Field Crops I	PS43	Small Fruit Crops		
	<i>Humanities Elective</i>	PS47	Turfgrass Production and Management <sup>1</sup>	PS50	Landscape Horticulture I
		PS53	Vegetable Production <sup>1</sup>	PS53	Vegetable Production <sup>1</sup>
				PS60	Landscape Plant Materials I
<b>Semester IV</b>					
AE34	Farm Tractors	B40	Plant Pathology	B40	Plant Pathology
AS35	Feeds and Feeding <sup>1</sup>	PS38	Nursery Crop Production	H140	Personnel Management
B40	Plant Pathology	PS41	Field Crops II	PS44	Tree Fruit Crops
EB41	Business Law	PS44	Tree Fruit Crops or PS49 Potato Production	PS61	Landscape Plant Materials II
PS41	Field Crops II			PS72	Landscape Maintenance
PS49	Potato Production	PS76	Plant Products Physiology	PS76	Plant Products Physiology
			<i>Humanities Elective</i>		

<sup>1</sup>May substitute PS65 Plant Science Project or PS147 Farm Woodlot Management if timetable permits.

A student who has successfully completed the first year with a good study record may apply for acceptance into a two-year program in Farming Technology.

A student who has successfully completed the two years of Plant Science with a good study record may apply for acceptance into a one-year program in Agricultural Technology.

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# Technology Programs

The Nova Scotia Agricultural College offers specialized two-year and three-year programs to prepare students for careers associated with laboratory techniques in Animal Health, Biology, Chemistry, and Food, and with the practice of Landscape Horticulture. These studies lead to a Diploma of Technology (Dipl.T.) in each of these areas.

A candidate for a Diploma of Technology may qualify for admission with high school completion or equivalent. See the syllabus for each program for specific admission requirements.

Accepted students are asked to complete and submit medical information on the form provided.

Each candidate must be available for an interview when requested.

Students who complete all the requirements with no mark below 50% of the maximum mark obtainable will be granted a Diploma of Technology (Dipl. T.).

A high honours diploma will be awarded to a student who has attained an average of at least 80%, and an honours diploma will be awarded to one who has attained an average of at least 75%.

It is the student's responsibility to see that the requirements for the diploma are fulfilled.

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## Technology Programs

### Animal Health Technology

The Animal Health Technology program is designed to prepare students with the skills and knowledge required to function as technical assistants to practising veterinarians, researchers, and other persons who deal with animals especially in a context of medicine or science.

#### **Academic Entrance Requirements**

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology, and one in Chemistry, or satisfactory completion of the Pre-Tech semester, is required. Applicants will be invited for a selection interview.

#### **Syllabus**

##### **Animal Health Technology**

##### **Year 1**

###### **Semester I**

AS10 Orientation to Animal Health  
AS34 Animal Nutrition  
B15 Animal Anatomy  
B20 Animal Physiology  
CS42 Organic Chemistry  
H10 Technical Writing

###### **Semester II**

AS11 Animal Handling  
AS15 Animal Genetics & Breeding  
AS30 Animal Science  
AS48 Animal Behaviour  
B225 Microbiology  
CS43 Bio-Organic Chemistry

##### **Year 2**

###### **Semester III**

AS24 Principles of Disease  
AS25 Animal Nursing & Clinical  
Procedures I  
AS37 Laboratory Animal Care I  
AS39 Veterinary Lab. Techniques I  
AS47 Animal Health  
EB10 Accounting

###### **Semester IV**

AS36 Principles of Pharmacology  
AS46 Animal Nursing & Clinical  
Procedures II  
AS49 Veterinary Lab. Techniques II  
H45 Technical Communications  
MP14 Computational Methods

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# Technology Programs

## *Animal Health Technology*

### *Year 3*

#### ***Semester V (May–December)***

- AS80 Externship – AVC
- AS81 Externship – Veterinary Practice
- AS82 Externship – Institutional

#### ***Semester VI***

- AS59 Veterinary Lab. Techniques III
- AS71 Laboratory Animal Care II
- AS75 Animal Nursing & Procedures III
- AS95 Animal Health Technology Project
- H140 Personnel Management
- MP70 Basic Statistics



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# Technology Programs

## Biology Technology

The Nova Scotia Agricultural College offers this program to prepare students for work as:

- laboratory assistants and demonstrators in academic institutions
- research assistants in university and government laboratories
- natural history curatorial assistants
- technologists trained to acquire data for environmental impact studies
- selected industrial quality control laboratory technologists
- technologists trained to acquire data in integrated pest management programs
- technologists to assist data acquisition of forestry or silviculture related programs
- technologists trained to work in the life sciences and related fields

### **Academic Entrance Requirements**

High School Graduation Certificate with pass marks in Biology, Chemistry, English, and Mathematics, at the following provincial levels: New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

### **Syllabus**

#### **Biology Technology**

##### **Year 1**

###### **Semester I**

B100	Botany
CS42	Organic Chemistry
CS68	Introductory Lab. Techniques
H10	Technical Writing
MP15	Introductory Physics

###### **Semester II**

B25	Histological Techniques
B110	Zoology
B225	Microbiology
CS43	Bio-Organic Chemistry
CS69	Introductory Instrumentation

##### **Year 2**

###### **Semester III**

B20	Animal Physiology
B200	Cell Biology
B265	Systematic Botany
CS12	Principles of Soil Science
CS30	Chemical Calculations

###### **Semester IV**

B40	Plant Pathology
B41	Plant Physiology
B48	Plant Tissue Culture
B55	Food Microbiology
MP70	Basic Statistics

##### **Year 3**

###### **Semester V**

AS34	Animal Nutrition
B35	Ecological Techniques
B43	Entomology
B45	Biology Practicum I
B330	Ecology

###### **Semester VI**

AS15	Animal Genetics & Breeding
AS37	Laboratory Animal Care I
B46	Weed Science
B60	Biology Practicum II
B75	Biological Photography

# Technology Programs

## Chemistry Laboratory Technology

The Nova Scotia Agricultural College offers this program to help students prepare for work as chemistry laboratory technologists with agricultural and chemical research agencies, university chemistry departments, food processing and distribution companies, environmental control services, quality control and analysis services, or with product development programs.

### **Academic Entrance Requirements**

High School Graduation Certificate with pass marks and an average of at least 60% in Biology, Chemistry, English, Mathematics, and one other course, all at the following provincial levels: New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII.

### **Syllabus**

#### **Year 1**

##### **Semester I**

CS30 Chemical Calculations  
CS42 Organic Chemistry  
CS68 Intro. Lab. Techniques  
CS100 Chemical Principles I  
(lectures only)  
H10 Technical Writing  
MP100 Calculus and Analytic  
Geometry I

##### **Semester II**

AS30 Animal Science<sup>1</sup>  
B225 Microbiology  
CS43 Bio-Organic Chemistry  
CS225 Quantitative Analytical Chem.  
MP70 Basic Statistics  
MP222 Computer Methods

#### **Year 2**

##### **Semester III**

CS50 Introduction to Physical Chemistry  
CS75 Basic Food Chemistry  
CS79 Project Organization  
CS220 Introduction to Soil Science  
CS305 Instrumental Analytical  
Chemistry  
*Elective*

##### **Semester IV**

CS73 Laboratory Organization  
and Management  
CS80 Project Implementation  
CS310 Radiotracers in Agriculture  
CS350 Food Chemistry  
CS370 Instrumental Food Analysis  
PS30 Introduction to Plant Science

<sup>1</sup>AS100 Introductory Animal Science can be substituted if timetable permits.

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## Technology Programs

### Food Laboratory Technology

The Nova Scotia Agricultural College offers this program to prepare students for employment as:

- technologists trained to work in food processing and analysis services
- quality control laboratory technologists in the food industry
- research assistants in government and university laboratories
- laboratory assistants and demonstrators in academic institutions involved in food-related fields
- technologists trained to assist with food product development

#### **Academic Entrance Requirements**

High School Graduation Certificate with pass marks and an average of at least 60% in Biology, Chemistry, English, Mathematics, and one other course, all at the following provincial levels: New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

#### **Syllabus**

##### **Year I**

###### **Semester I**

CS42	Organic Chemistry
CS68	Introductory Laboratory Techniques
CS100	Chemical Principles (Lectures only)
H10	Technical Writing
MP15	Introductory Physics

###### **Semester II**

B225	Microbiology
CS40	Food Laboratory Methods
CS43	Bio-Organic Chemistry
MP70	Basic Statistics
MP222	Computer Methods

##### **Food Laboratory Technology**

##### **Year 2**

###### **Semester III**

AS34	Animal Nutrition
AS345	Eggs and Dairy Products
CS30	Chemical Calculations
CS75	Basic Food Chemistry
CS305	Instrumental Analytical Chemistry

###### **Semester IV**

AE35	Fundamentals of Food Processing
B55	Food Microbiology
CS225	Quantitative Analytical Chemistry
CS350	Food Chemistry
CS370	Instrumental Food Analysis

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# Technology Programs

## *Year 3*

### ***Semester V***

CS85 Food Laboratory Practicum

### ***Semester VI***

AS350 Meat Science

B41 Plant Physiology

CS55 Quality Control &  
Consumer Acceptance

CS73 Laboratory Organization  
and Management

PS76 Plant Products Physiology

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## Technology Programs

### Landscape Horticulture Technology

The Nova Scotia Agricultural College offers this two-year program to help prepare students for careers with landscaping firms, planning agencies, recreational parks, institutions, or in self-employed roles as landscape horticultural technologists.

#### **Academic Entrance Requirements**

High School Graduation Certificate with pass marks and an average of at least 60% in Biology, English, Mathematics, and two other courses, all at the following provincial levels: New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII. Additionally, the applicant must have passed one senior high school Chemistry course.

#### **Syllabus**

##### **Year 1**

##### **Semester I**

AE12	Drafting
CS12	Principles of Soil Science
PS47	Turfgrass Production and Management
PS50	Landscape Horticulture I
PS55	Plant Propagation
PS60	Landscape Plant Materials I

##### **Semester II**

AE38	Horticultural Engineering
B40	Plant Pathology
B41	Plant Physiology
CS13	Soil Management
PS51	Residential Landscape Design and Construction
PS61	Landscape Plant Materials II

##### **Spring Session**

PS70	Landscape Techniques – 6 weeks
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##### **Year 2**

##### **Semester III    Semester IV**

AE14	Surveying	B46	Weed Science
B43	Entomology	H60	Communication Techniques
EB10	Accounting	H140	Personnel Management
MP222	Computer Methods	PS38	Nursery Crop Production
PS39	Greenhouse Crop Management	PS72	Landscape Maintenance
PS71	Arboriculture	PS74	Landscape Design and Construction
PS73	Landscape Horticulture II		



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# Technology Programs for Technician Graduates

The College offers programs leading to a Diploma of Technology in Agricultural Technology, Agricultural Engineering Technology, and Farming Technology. See the syllabus of each program for specific admission requirements.

It is the student's responsibility to see that the requirements for the awarding of the diploma are fulfilled.

## **Agricultural Technology**

The College also offers courses designed to help technicians become more proficient in their chosen fields of agricultural endeavour. These studies lead to a Diploma of Technology (Dipl. T.) in Agricultural Technology.

A person with a NSAC technician diploma or with equivalent standing may apply to continue studies in the technical program. A combination of courses and projects may be selected to help the student prepare for a chosen field of agricultural endeavour.

The program of study must be developed with the Dean of Vocational and Technical Education. A Technology Project course (AE90, AS90, EB90, or PS90) is to be included and must first be approved by the corresponding department. In doing so, the department will consider the appropriateness and feasibility of the specific project idea, as well as the student's ability to pursue an independent project, based on performance in the previous technician or equivalent program. Other subjects may include those normally taken by other technical or degree students, providing all subject prerequisites are met.

A Diploma of Technology (Dipl.T.) in Agricultural Technology will be awarded to the student who satisfactorily completes 12 approved courses, including a Technology Project course, and who earns an average of at least 60%. A diploma with honours is awarded if an average of at least 75% is attained and a mark of at least 75% is attained on the Technology Project. A diploma with high honours is awarded if an average of at least 80% is attained and a mark of at least 80% is attained on the Technology Project.

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# Technology Programs for Technician Graduates

## Agricultural Engineering Technology

The Nova Scotia Agricultural College offers a two-year course for students who wish to achieve high levels of proficiency in Agricultural Engineering Technology.

Students who have completed or are completing the first year of the Agricultural Engineering or Farm Equipment Technician program and have a good study record may apply for admission to the Agricultural Engineering Technology program.

### Syllabus

#### Year 1

##### Semester I

AE48	Shop Management
AE49	Electrical Systems
AE63	Tractor Power
H140	Personnel Management
MP100	Calculus and Analytic Geometry I
PS100	Principles of Crop Production

##### Semester II

AE27	Welding <sup>1</sup>
AE36	Controls & Processing
AS100	Introductory Animal Science
EB110	Agricultural Economics
MP105	Calculus and Analytic Geometry II
MP222	Computer Methods

##### Summer Session

AE260	Surveying – 2 weeks
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#### Year 2

##### Semester III

AE79	Technology Project
AE305	Engineering Measurements and Controls
AE231	Agricultural Machinery
AE335	Materials Handling and Processing
AE340	Soil and Water <i>Approved Elective</i>

##### Semester IV

AE80	Technology Report
AE320	Agricultural Structures
AE345	Energy in Agriculture
H60	Communication Techniques
	<i>Approved Elective</i>
	<i>Approved Elective</i>

<sup>1</sup>If students have completed AE27, but not AE19 Technical Drawing, then AE19 will be required during the semester.

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# Technology Programs for Technician Graduates

## Farming Technology

The Nova Scotia Agricultural College offers this program to help students prepare for a career as a farmer on a self-employed basis, or as a manager on a commercial farm.

Students wishing to pursue studies leading to a Diploma of Technology in Farming register for the first year of the Agricultural Business, Animal Science, Plant Science, or Agricultural Engineering Technician program. After successful completion of the first year, their applications are considered for the Farming Technology program. Students with equivalent prerequisites from other college programs can also be considered. If accepted, the student's program of studies includes a minimum of three semesters of prescribed courses, four months of approved farm experience, and seven months of on-farm training under the direction of a farming instructor.

### **Entrance Requirements**

Satisfactory completion of Year One in the Agricultural Business, Agricultural Engineering, Animal Science, or Plant Science Technician program and a satisfactory selection interview are required.

### **Syllabus**

Four months of approved farm experience is to be completed before Semester I.

### **Year 1**

#### **Semester I**

AS29 Farm Practices  
CS12 Principles of Soil Science  
CS14 Agricultural Chemistry  
EB10 Accounting  
EB40 Marketing Practices  
EB340 Farm Management I  
H10 Technical Writing  
MP15 Introductory Physics  
PS40 Field Crops I

#### **Semester II**

AE34 Farm Tractors  
CS13 Soil Management  
EB11 App. Acct. & Taxation  
EB220 Production Economics  
MP14 Computational Methods  
PS41 Field Crops II

#### **Semester III**

A seven-month contract—EB70 On-farm training—is developed between the College, the student, and a training farmer, following the first year of the program.

### **Year 2**

#### **Semester IV**

EB42 Applied Farm Management  
EB72 Farm Project

## Technology Programs for Technician Graduates

All students accepted into the program must have 12 credits based on the work of the previous year.

In order to satisfactorily complete the requirements for a Diploma of Technology in Farming, a student must complete all required courses, the on-farm training, and 13 of the approved electives, and must fulfill the experience requirement.

### **Recommended Electives:**

#### **Semester I**

AE12	Drafting
AE13	Shopwork
AE14	Surveying
AE30	Farm Machinery
AE32	Farm Buildings
AE45	Soil and Water Management
AS20	Farm Animal Breeding
AS34	Animal Nutrition
AS47	Animal Health
AS53	Poultry Production
B20	Animal Physiology
B43	Entomology
EB12	Macroeconomics
PS39	Greenhouse Crop Management
PS43	Small Fruit Crops
PS53	Vegetable Production
PS55	Plant Propagation
PS147	Farm Woodlot Management
	Humanities Course

#### **Semester II or IV**

AE15	Oil Hydraulics
AE20	Shopwork Practices
AE27	Welding
AE36	Controls & Processing
AE38	Horticultural Engineering
AE39	Tractor Overhaul
AS33	Applied Animal Physiology
AS35	Feeds & Feeding
AS50	Dairy Production
AS51	Beef & Sheep Production
AS52	Swine Production
AS55	Fur Production
B40	Plant Pathology
B41	Plant Physiology
B46	Weed Science
EB13	Microeconomics
EB41	Business Law
PS30	Introduction to Plant Science
PS38	Nursery Crop Production
PS44	Tree Fruit Crops
PS49	Potato Production
PS76	Plant Products Physiology

Students who complete all the requirements with no mark below 50% of the maximum mark obtainable will be granted a Diploma of Technology (Dipl.T.).

A high honours diploma will be awarded to a student who has attained an average of at least 80%; and an honours diploma will be awarded to one who has attained an average of at least 75%. For a Diploma in Agricultural Technology to be awarded, the student's mark in the Farm Project must also be at or above the minimum average mark required for honours and high honours diplomas.



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# Description of Courses

The course descriptions are grouped according to discipline and are in alphabetical and numerical order.

The Faculty reserves the right to make any necessary revisions or additions.

## Agricultural Engineering

### **AE12: Drafting**

Instructor: **Prof. Blanchard**

Designed to help the student become proficient in this field. This is accomplished by practice printing, the use of instruments, and freehand sketches or orthographic, oblique, and isometric drawings. Blueprint reading and CAD are also introduced.

Fall semester — 1 lec and 4 labs per week.

### **AE13: Shopwork**

Instructors: **Prof. Havard and Messrs. Hampton, Bhola, and Roode**

The selection, operation, and maintenance of workshop tools in the modern metal- and woodworking shop are studied. In addition special topics in metallurgy, welding, and cabinetry are covered in lecture and lab format. Students are required to develop plans for a future shop project.

Fall semester — 2 lecs and 4 labs per week.

Text — Burke and Wakeman, *Modern Agricultural Mechanics*.

### **AE14: Surveying**

Instructor: **Prof. Madani**

An introduction to surveying principles and recording techniques. Students are given lectures and assignments to assist in understanding the principles employed in surveying, and they practise these during the labs by conducting various surveying exercises. Practice is gained in the proper use of surveying instruments — tape, level, and transit — through exercises involving measurements of horizontal and vertical distances and angles. These include chaining, stadia, benchmark, profile and contour leveling, triangulation and traverse exercises, and construction surveying, with emphasis on their application to farm construction projects.

Fall semester — 2 lecs and 4 labs per week.

### **AE15: Oil Hydraulics**

Instructor: **Prof. Rifai**

Introduction to pressure and flow concepts of oil as applied to hydraulic systems. Pressure and flow theory and principles of pump, actuator, and valve operations are discussed. Open-centred, closed-centred, and pilot-operated hydraulic systems, hydrostatic transmission, power steering, hydraulic motors, and other accessories found on farm machinery are studied. Selection, maintenance, and repair procedures and standards are introduced.

Winter semester — 3 lecs and 2 labs per week.



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### **AE19: Technical Drawing**

Instructor: **Prof. Cunningham**

*Prerequisite:* AE12

Includes pictorial drawings and sketches, both architectural and mechanical. Practice is obtained in drawing sections, developing irregular shapes, preparing construction drawings for farm buildings. Students use both drafting machines and CAD. Throughout the course, students are encouraged to develop their own style, building on basics gained in drafting. They also make their own blueprints to determine the effect of varying line weights and drafting aids.

Winter semester — 1 lec and 4 labs per week.

### **AE20: Shopwork Practices**

Instructors: **Prof. Havard and Messrs. Bholá and Hampton**

*Prerequisite:* AE13

Practices in various types of shops are investigated such as cabinetry, body, jobber, and automated manufacturing. Special topics include plumbing, masonry, fiberglass, and CNC lathe. Students construct individual projects in lab period with emphasis on project planning and practices in the shop.

Winter semester — 2 lecs and 4 labs per week.

Text — Burke and Wakeman, *Modern Agricultural Mechanics*.

### **AE23: Farm Equipment Dealership**

Instructor: **Prof. Cunningham**

A spring course during which the student studies and works with a selected farm equipment dealer-instructor. Instruction covers all aspects of the farm equipment dealership operation. Students are rated on a specific list of skills and procedures.

Spring term — 6 weeks.

### **AE27: Welding**

Instructors: **Prof. Adsett and Mr. Wayne Roode**

*Prerequisite:* AE13

Principles and practices of oxyacetylene welding, cutting and brazing, and electric arc welding of steel in flat, vertical, and overhead positions are included. Welding of cast iron and aluminum, and metal-inert-gas (MIG) techniques are presented. Safety precautions and necessary metal machining procedures are emphasized. A lab fabrication project and a seminar presentation are included.

Winter semester — 2 lecs and 4 labs per week.

Text — Pender, *Welding* (3rd edition).

### **AE30: Farm Machinery**

Instructor: **Prof. Adsett**

*Prerequisite:* MP14 or MP15

Operating principles of the basic types of farm machinery for soil preparation, planting, chemical and fertilizer application, and harvest are studied. Machine operations are also discussed with respect to work rates, material flow rates, and power requirements. Laboratory sessions emphasize safety, as well as proper maintenance, adjustment, and calibration of the machinery.

Fall semester — 2 lecs and 4 labs per week.

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## Description of Courses

### **AE32: Farm Buildings**

Instructor: **Prof. Allen**

*Prerequisites:* AE12, MP15

Deals with construction and layout of farm buildings and includes the study of construction techniques and design considerations. Included are such topics as materials, space requirements and building layout, structural requirements, and insulation and ventilation. Students are required to prepare drawings of building features and components, as well as material lists from construction drawings, and to become familiar with standards of all classes of farm buildings through use of codes of recommended building practice.

Fall semester — 2 lecs and 4 labs per week.

### **AE34: Farm Tractors**

Instructor: **Prof. Rifai**

Introduction to the principles of power generation and transmission as applied to farm tractors. Two- and four-stroke gasoline and diesel engines are studied and compared. Operation principles and components of transmissions are discussed, including gear types and ratios, lubrication, auxiliary transmissions, hydraulic drives, and differentials. Basic concepts of performance testing, maintenance, and operation are introduced.

Winter semester — 2 lecs and 4 labs per week.

### **AE35: Fundamentals of Food Processing**

Instructor: **Prof. Blanchard**

The theory and application of food processing equipment is discussed. Theory includes fluid mechanics, heat transfer thermodynamics, and measurement applied to food material. Equipment such as pumps, fans, size reducers, conveyors, dryers, refrigeration, and heaters are examined. Process conditions and methods as applied to various food products will be covered. Field trips will supplement lectures and labs.

Winter semester — 2 lecs and 4 labs per week.

### **AE36: Controls and Processing**

Instructor: **Prof. Adsett**

*Prerequisite:* MP15

*Preparatory:* AE12

Basic AC electrical theory is examined and applied to farmstead wiring and process control. Electric heaters, switches, single-phase and three-phase motors, and motor controllers are covered, as well as electrical distribution panels. Low voltage control circuits are included, and electronic components and software are introduced as they apply to farm materials-handling systems. Laboratory assignments deal with electrical circuits and components, plus various types of conveyors, water and feed supply systems, and milking systems.

Winter semester — 2 lecs and 4 labs per week.

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## Description of Courses

### ***AE38: Horticultural Engineering***

Instructor: ***Prof. Sibley***

Small gasoline engine structure and operating theory are studied, with emphasis on engine maintenance and trouble-shooting. This course includes basic hydraulic theory, emphasizing the operation of common systems in use today. A wide range of horticultural machinery is studied, as well as the principles of mixing, placing, and curing concrete, fence making, and chain saw operation.

Winter semester — 2 lecs and 4 labs per week.

### ***AE39: Tractor Overhaul***

Instructor: ***Prof. Sibley and Mr. Grant Tery***

*Prerequisite:* AE63

*Preparatory:* AE20

Complete diagnosis, cost estimating, and overhaul of tractor engines and power trains. The theory and knowledge gained in previous courses are used along with overhaul techniques introduced in this course.

Winter semester — 1 lec and 6 labs per week.

### ***AE40: Field Equipment Overhaul***

Instructor: ***Prof. Adsett and Mr. Fred Hampton***

*Prerequisite:* AE30

*Preparatory:* AE20

Experience in overhauling farm equipment is gained in a process that includes inspection of equipment, estimation of parts and repairs required, cost prediction, and completion of overhaul work. Students work in teams, and appropriate records are kept. The classroom component of the course includes study and seminar presentation of a topic related to the understanding of field equipment design and function.

Winter semester — 1 lec and 6 labs per week.

### ***AE45: Soil and Water Management***

Instructor: ***Prof. Madani***

*Prerequisite:* AE14

Fundamentals of soil and water engineering with application to agricultural and recreational lands. The course deals with rudimentary hydrology, soil erosion, drainage systems, irrigation systems, marshland improvement, and other associated topics. The concept of water table management is introduced. Laboratory periods cover design problems, project field labs, and tours.

Fall semester — 2 lecs and 4 labs per week.

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## Description of Courses

### **AE48: Shop Management**

Instructor: **Prof. Cunningham**

*Prerequisite:* AE23

A study of the management of a farm equipment dealership. Topics include organizational structure; responsibilities of each level of management and of each department within the dealership; communication within each department, with each other, and with the customer; and controls involved, including work orders, time records, and part inventory control.

Fall semester — 3 lecs and 2 labs per week.

### **AE49: Electrical Systems**

Instructor: **Prof. Sibley**

*Prerequisite:* MP15

Basic principles of electricity and electrical circuits are studied. Particular emphasis is placed on the function, description, and principles of operation of tractor electrical systems and components. Methods of diagnosis of faulty systems and components are covered.

Fall semester — 2 lecs and 4 labs per week.

Text — John Deere, *FOS: Electrical Systems*.

### **AE63: Tractor Power**

Instructor: **Prof. Sibley**

*Prerequisite:* MP15

The theory and types of diesel and gasoline engines and the principles and theory of power development and transmission in farm tractors are studied. Small engines are included. Test equipment is used during the lab work.

Fall semester — 2 lecs and 4 labs per week.

Text — John Deere, *FOS: Engines; FOS: Power Trains*.

### **AE65: Project-Seminar**

Coordinator: **Prof. Blanchard**

Presentation of a seminar and written report on an approved agricultural mechanization or farm equipment topic. Lectures review method of presentation and preparation of selected topics. Projects are under the supervision of selected staff members.

Winter semester — 1 lec per week and labs to be arranged.

### **AE68: Farmstead Equipment Overhaul**

Instructor: **Prof. Cunningham and Mr. Fred Hampton**

*Prerequisite:* MP15

*Preparatory:* AE20

Equipment used within and around buildings is overhauled after first analyzing the individual equipment and establishing the repairs and parts required as well as the probable costs.



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## Description of Courses

Winter semester — 1 lec and 6 labs per week.

### **AE79: Technology Project**

Coordinator: **Department Staff**

This project will consist of a comprehensive study of a specific topic of agricultural engineering in which the student is interested or has experience. The project should be technical in nature and may consist of testing, developing, or examining, or an in-depth literature study. A written synopsis of the proposed project will be presented to the supervising staff member before the project is started.

Fall semester — 1 lec per week and labs to be arranged.

### **AE80: Technology Report**

Coordinator: **Department Staff**

A report on the technology project previously completed will account for the work done and show the knowledge and understanding required. Factual results, observations, and conclusions will be included in a prescribed format. A seminar on the project will be presented when the report is complete.

Winter semester — 1 lec per week and labs to be assigned.

### **AE90: Technology Project**

Coordinator: **Department Staff**

This project provides an opportunity for the students to study in detail an Agricultural Engineering topic of special interest. This must be a new topic, but may build on other aspects of the study program. The student pursues studies under a project supervisor. The project plan developed with the advisor must include the purpose of the study, the procedures and materials used, a time schedule for the work involved, the method in which the information will be collected, the way in which the comparisons and conclusions will be developed, and the format for the final report. Both a written and oral report will be required. The mark is normally reported in the student's final semester, but studies should commence early in the first semester.

Time to be announced.

### **AE100: Graphics and Projection (EN)**

Instructor: **Prof. Cunningham**

Freehand sketching and instrument drawing are used to explore the fundamental principles of projection and to apply these to the solution of problems of orthographic projection in descriptive geometry as required by the design process. Emphasis is placed on the application of graphical techniques to the solution of engineering problems.

Fall semester — 2 lecs and 4 labs per week.

Text — Earle, *Engineering Design Graphics*.



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## Description of Courses

### **AE110: Statics (EN)**

Instructor: **Prof. Blanchard**

A one-semester course in applied mechanics covering the topic of the static equilibrium of particles, rigid bodies, machine elements, and structures under the action of forces. Emphasis is placed on the understanding of the fundamental principles of mechanics and their application to the solution of real problems in both two and three dimensions. Vector analysis and free body diagrams are used extensively throughout the course. Specific topics include the equilibrium of particles and rigid bodies, forces in a plane and in space, equivalent force systems, equilibrium of rigid bodies in two and three dimensions, analysis of structures and machine elements, and friction. Additional topics such as distributed forces, centroids, centres of gravity, and moments of inertia will be covered as time allows.

Winter semester — 3 lecs and 4 labs per week.

Text — Hibbeler, *Engineering Mechanics*.

### **AE150: Engineering in Agriculture (AE)**

Coordinator: **Prof. Harvard**

A basic understanding of Agricultural Engineering systems is developed. This involves the engineering approach to management of the physical agricultural resources of land, structures, and machinery, in which concerns of sustainable agriculture and environmental maintenance are also addressed. Students are also introduced to emerging technologies in knowledge systems, bio-engineering, and energy management.

Fall semester — 3 lecs and 2 labs per week.

### **AE205: Graphics and Design (EN)**

Instructor: **Prof. Cunningham**

*Prerequisite:* AE100

Graphical techniques are applied to vector analysis of design problems and to the presentation of design data. Design practices are investigated and used in student projects aimed at developing creativity in the design process.

Winter semester — 1 lec and 4 labs per week.

Text — Earle, *Engineering Design Graphics*.

### **AE220: Dynamics I (EN)**

Instructor: **Prof. Rifai**

*Prerequisites:* AE110, MP105

Provides the background for describing particle and line motion. This includes relative, rectilinear, curvilinear, and rotational motion of particles. Force, impulse, momentum, and work methods of analysis are introduced.

Fall semester — 3 lecs and 3 labs per week.

Text — Beer and Johnson, *Vector Mechanics for Engineers*.

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## Description of Courses

### **AE225: Dynamics II (EN)**

Instructor: **Prof. Rifai**

*Prerequisite:* AE220

A continuation of the dynamics of particles developed in AE220 to apply to rigid bodies. Plane motion of rigid bodies is emphasized.

Winter semester — 3 lecs and 3 labs per week.

Text — Beer and Johnson, *Vector Mechanics for Engineers*.

### **AE231: Agricultural Machinery (AE)**

Instructor: **Prof. Rifai**

*Prerequisite:* MP110 or MP130

The selection, use, and principles of operation of farm machinery are studied. Emphasis is placed on crop production machinery — tillage, planting, chemical and fertilizer application, and different harvesting systems. Other types of farm machinery will also be covered. Principles and methods of power transfer (hitching, pto, hydraulics) will be examined.

Fall semester — 3 lecs and 3 labs per week.

Text — Kepner, Bainer, and Badger, *Principles of Farm Machinery*.

### **AE260: Surveying (EN)**

Instructor: **Prof. Madani**

*Prerequisite:* MP100

*Preparatory:* MP105

An introduction to the use of surveying instruments and practices. Distance measurements; differential, profile, and cross-sectional leveling; transit traverses; and construction surveying are covered. Error calculating is introduced, and principles of surveying for construction are developed.

Time — 2 weeks following winter semester.

### **AE305: Engineering Measurements and Controls (AE)**

Instructor: **Prof. Havard**

*Prerequisite:* MP110 or MP130

The course examines the fundamentals for measurement of environmental parameters such as temperature, pressure, humidity, stress, and strain. The use of electronic instruments and microcomputers is demonstrated through laboratory exercises. Several methods of control are investigated.

Fall semester — 3 lecs and 3 labs per week.

### **AE310: Thermodynamics (EN)**

Instructor: **Prof. Allen**

*Prerequisite:* MP135

Thermodynamics is a study of energy and energy transfers in the form of work and heat, and the effect these transfers have on the properties of selected substances. First and second law analyses are covered including entropy, availability, and efficiencies.

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## Description of Courses

Fall semester — 3 lecs and 3 labs per week.

Text — Moran and Shaaro, *Fundamentals of Engineering Thermodynamics*.

### **AE315: Strength of Materials (EN)**

Instructor: **Prof. Allen**

*Prerequisites:* AE110, MP105, MP130

This course presents an introduction to the basic principles of stress, strain, and stability and the response of engineering materials to the application of force and of force-induced effects. Topics include definition of stress-strain, stress-strain diagrams for ductile and brittle materials, axially loaded members, torsion, shear force and bending moment, stability and buckling, and biaxial stress and strain.

Winter semester — 3 lecs and 2 labs per week.

Text — Hibbeler, *Mechanics of Materials*.

### **AE320: Agricultural Structures (AE)**

Instructor: **Prof. Allen**

This is a general agricultural structures course covering topics of building materials and introduction to design process. Ventilation principles are presented. Functional layouts of storage and production buildings are considered. Field trips supplement the lecture material. A term paper is required.

Fall semester — 3 lecs and 3 labs per week.

Text — Agriculture Canada, *Canadian Farm Buildings Handbook*.

### **AE325: Agricultural Tractors (AE)**

Instructor: **Prof. Sibley**

*Prerequisite:* MP110 or MP130

The principles and methods of power generation and transmission in farm tractors are studied. Theory and operation of two- and four-stroke diesel and gasoline engines are covered, as well as clutches, different types of transmissions, and tractor final drives. Traction, hydraulics, and electrical systems are also covered, as well as field operation and tractor safety.

Winter semester — 3 lecs and 3 labs per week.

Text — Georing, *Engine and Tractor Power*.

### **AE330: Hydrology (AE)**

Instructor: **Prof. Madani**

*Prerequisites:* MP105, and either MP110 or MP130

Introduction to the basics of hydrology investigations. Topics include the use of maps, elementary statistics applied to hydrology, climatic measurements, infiltration soil moisture analysis, evaporation, evapotranspiration, runoff, hydrographics, probability analysis, groundwater flow, well hydraulics, and applications to agricultural engineering problems.

Winter semester — 3 lecs and 3 labs per week.



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## Description of Courses

### **AE335: Materials Handling and Processing**

Instructor: **Prof. Adsett**

*Prerequisite:* MP105

*Preparatory:* MP130

Basic operations in on-farm materials handling and processing are covered. Operations are described mathematically and discussed in relation to material flow rates and energy requirements. Electric power is discussed with respect to on-farm distribution, demand sizing, controls, and safety. Laboratory topics include electric circuits, motors, pumps, grain drying, solid materials conveyors, and milking systems.

Fall semester — 3 lecs and 3 labs per week.

Text — Agriculture Canada, *Agricultural Materials Handling Manual*.

### **AE340: Soil and Water (AE)**

Instructor: **Prof. Madani**

*Prerequisite:* MP105

*Corequisite:* CS220

This course covers the hydrologic cycle and its components; basic soil-water-plant relationships, drainage theory and design; irrigation systems and design including crop water requirements, water supply and quality, water conveyance, and salinity control. The concept of water table management and its application in the Maritime region is also covered. Special problems inherent in Atlantic agriculture are studied such as marsh reclamation, erosion control practices, and stream bank stabilization. Laboratory periods cover design problems, measurements of soil moisture and soil moisture related properties, flow measurement, and field trips.

Fall semester — 3 lecs and 4 labs per week.

Text — Schwab et al., *Soil and Water Conservation Engineering*.

### **AE345: Energy in Agriculture (AE)**

Instructor: **Prof. Havard**

*Prerequisite:* MP105

This course begins with an overview of the world, national, and regional energy situation and its relation to agriculture. Energy use and conservation for various operations in modern agriculture are addressed. Laboratory exercises emphasize evaluation of efficiency of machines and systems.

Winter semester — 3 lecs and 3 labs per week. (Offered in alternate years; next offered in January 1995.)

### **AE350: Fluid Mechanics (EN)**

Instructor: **Prof. Madani**

*Prerequisite:* AE220

A study of physical properties of liquids and gases, fluid statics, and fluid flow — including pressure, manometry, hydrostatic forces, stream lines and tubes, continuity, momentum, Bernoulli equation, energy equation, flow measurement, viscous flow, and dimensionless numbers.



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## Description of Courses

Winter semester — 3 lecs and 2 labs per week.

Text — Robertson and Crowe, *Engineering Fluid Mechanics* (4th edition).

### **AE400: Agricultural Mechanization Systems (AE)**

Instructor: **Prof. Adsett**

*Prerequisite:* MP105 or MP130

*Preparatory:* EB340

Principles of engineering economics are applied to agricultural investment alternatives, primarily as related to mechanized systems. Field operations from soil tillage to crop harvest are examined with respect to machine performance, power requirement, timeliness, and machinery selection. Effects of soil and climate are included. Laboratory sessions include problem tutorials, and visits to selected farms. A term project applies the techniques presented in the course to the solution of a practical mechanization problem of the student's interest.

Winter semester — 2 lecs and 4 labs per week. (Offered in alternate years; next offered in January 1994.)

### **AE449: Project-Seminar I (AE)**

Coordinator: **Prof. Blanchard**

*Prerequisite:* Agricultural Mechanization student in final year or consent of the coordinator.

A specific project in Agricultural Mechanization will be studied and researched by the student. Each student will present periodic written and oral reports on the subject of investigation. Other written and seminar topics will be assigned. The research project and faculty advisor will be chosen, in consultation with the course coordinator, during Semester VI; this will enable students to work on their projects during the summer preceding their final year, if necessary.

Winter semester — 1 scheduled seminar session per week.

### **AE450: Project-Seminar II (AE)**

Coordinator: **Prof. Blanchard**

*Prerequisite:* AE449

*Restricted to Agricultural Mechanization students in their final year.*

Students will continue with their projects and seminars as assigned by their advisor. The course will culminate with a written report and an oral presentation of their scientific report.

Winter semester — 4 labs per week.

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## Description of Courses

### Animal Science

#### **AS10: Orientation to Animal Health**

Instructor: **Prof. Ramsay**

This course is designed to introduce the AHT student to the field of Animal Health and to begin training in the animal care duties associated with cats and dogs. The history and use of AHTs and their equivalents is followed by an examination of the principles of sanitation and disease control in the animal facility. Application of these principles is practised in assigned periods of duty in the College's facilities. The topics of credentials and legislation are introduced, especially as these relate to the AHT. The routines followed in animal hospitals, research institutions, and other places where AHTs are employed are examined with special reference to the duties and responsibilities of the technical assistant. Routes of drug administration are defined and demonstrated, and specific dose rate calculations are performed. In practical sessions the student learns to operate and maintain specified items of clinical equipment.

Fall semester — 4 lecs per week.

#### **AS15: Animal Genetics and Breeding**

Instructor: **Prof. Crober**

This course covers the basic principles of Mendelian and quantitative genetics with reference to animal populations, and how genetics relates to animal health and production. The course includes examples from laboratory animal species, farm animals, and companion animals.

Winter semester — 3 lecs and 2 labs per week.

#### **AS20: Farm Animal Breeding**

Instructor: **Prof. Patterson**

The course covers the basic principles of Mendelian and quantitative genetics as they apply to farm animal production. Breeds and improvement programs are discussed for each species. Specific topics include selection procedures and recording programs, computer simulation of breeding programs, and applications of biotechnology.

Fall semester — 3 lecs and 2 labs per week.

#### **AS24: Principles of Disease**

Instructor: **To be announced**

*Prerequisites:* AS10, B15, B20, B225

*Corequisite:* AS47

This classroom course is intended to lay a base for the student to continue to learn about disease in animals throughout the program and after graduation. The principles of pathology and pathophysiology are covered, and samples of diseases are used to demonstrate how AHTs should approach the study of diseases encountered in other courses and later in their careers. The terminology used in describing disease states is stressed.

Fall semester — 3 lecs per week.

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## Description of Courses

### **AS25: Animal Nursing and Clinical Procedures I**

Instructor: **Prof. Ramsay**

Prerequisite: AS10

Corequisite: AS24

This combined classroom and clinical course outlines the principles and methods associated with drug administration, anesthesiology, surgical preparation, sample collection, and radiography in addition to the application of simple bandages and splints. The major animal types used are the dog and cat, but certain clinical periods will deal with procedures performed on livestock. Student performance should demonstrate observance of principles and good manual skills.

Fall semester — 4 lecs and 4 labs per week.

### **AS29: Farm Practices**

Coordinator: **Prof. Maynard**

Students are required to develop a basic understanding of, and competence in, livestock handling, tractor operation, and such other practices as ploughing, welding, operation of a chain saw, fencing, field measurement, and yield calculation. These abilities may be learned on campus or on approved farms, and a final evaluation of each is recorded. Some weekend work is involved. The time for completing this course may be extended to cover more than one semester.

### **AS30: Animal Science**

Instructor: **To be announced**

This course examines the place of livestock on Atlantic region farms, with some emphasis on the integration of crops and livestock. It studies the needs of livestock for feeding, housing, and the maintenance of health, and includes an examination of management.

Winter semester — 3 lecs and 2 labs per week.

### **AS33: Applied Animal Physiology**

Instructor: **Prof. Lirette**

Deals with aspects of animal function of particular relevance to animal production. Subject areas include reproduction, growth and development, digestion and metabolism, and environmental physiology. Emphasis is placed on practical details.

Winter semester — 2 lecs and 2 labs per week.

### **AS34: Animal Nutrition**

Instructor: **To be announced**

The principles of the nutrition of domestic animals are discussed as a foundation for understanding the application of nutrition to the farm situation. Emphasis is given to the need for and use of specific nutrients.

Fall semester — 3 lecs per week.



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## Description of Courses

### **AS35: Feeds and Feeding**

Instructor: **To be announced**

*Prerequisite:* AS34

The basic composition of feeds, the methods of feed formulation, and the use of nutrient requirements tables are studied. Specialized feeding programs for all common domestic species are demonstrated. Applications of basic nutrition principles are discussed in relation to on-farm conditions.

Winter semester — 3 lecs and 2 labs per week.

### **AS36: Principles of Pharmacology**

Instructor: **Dr. Prowse**

*Prerequisites:* AS25, B20

In this classroom course the student learns about the major classes of drugs based on therapeutic activity. A base is built so that learning can continue whenever medications are encountered later in the program or in the AHT's career. Methods of drug action, metabolism and excretion, biological variability, and drug reactions are studied and pertinent legislation emphasized. Dispensing instructions are reviewed, and principles of maintaining drug inventories are examined. Various costing formulae used in veterinary practices are outlined and their application is simulated.

Winter semester — 3 lecs per week.

### **AS37: Laboratory Animal Care I**

Instructor: **Prof. Ramsay**

*Prerequisite:* B20

This introductory course is designed to instruct the student in the proper care, handling, and use of the small laboratory animal. Students learn the characteristics and special requirements of specific laboratory animal species. The design and maintenance of animal research facilities is studied. Students are required to complete assigned periods of duty in the College's animal facility. This course stresses compliance with Canadian Council on Animal Care Guidelines.

Fall semester — 2 lecs and 2 labs per week.

### **AS39: Veterinary Laboratory Techniques I**

Coordinator: **Prof. Ramsay**

*Prerequisites:* B225, CS42

*Corequisite:* AS24

In classroom and lab practical sessions this course covers a variety of techniques commonly required of the AHT in the veterinary hospital laboratory. Operation and maintenance of the microscope is reviewed; the skills required in the clinical laboratory pertinent to microbiology, parasitology, urinalysis, and certain aspects of blood analysis are practised. In the classroom various aspects of microbes and parasites significant in animal disease are dealt with. Performance in laboratory techniques should demonstrate observance of principles and good manual skills.

Fall semester — 4 lecs and 6 labs per week.



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## Description of Courses

### **AS46: Animal Nursing and Clinical Procedures II**

Instructor: **To be announced**

**Prerequisites:** AS24, AS25

This course re-examines similar topics to those covered in Animal Nursing and Clinical Procedures I with emphasis on more advanced AHT involvement and problem solving in both classroom and clinical periods. Physical assessment of the small animal and livestock patient is also dealt with, and intensive-care practices are included with special attention to administration of fluids, the EKG, and resuscitative measures. The student is expected to perform with minor supervision and should demonstrate observance of principles and good manual skills.

Winter semester — 4 lecs and 4 labs per week.

### **AS47: Animal Health**

Instructor: **To be announced**

Teaches the student about organismal and other causes of disease, how to recognize health and ill health, and how to understand the principles of disease prevention and treatment.

Fall semester — 2 lecs and 2 labs per week.

### **AS48: Animal Behaviour**

Instructor: **Prof. Tennessen**

Students are introduced to the basic characteristics of animal behaviour. Topics covered will include: ethology as a diagnostic tool, techniques for handling animals, aggression and fear, animal welfare, feeding and drinking, and animal behaviour counselling. The relationship between behaviour and housing will also be emphasized.

Winter semester — 2 lecs and 1 lab per week.

### **AS49: Veterinary Laboratory Techniques II**

Coordinator: **Prof. Ramsay**

**Prerequisite:** AS39

**Corequisite:** AS46

This course continues the general format of Laboratory Procedures I concentrating on haematology, urine cytology, and certain serum chemistry techniques. Part of the classroom component is devoted to the changes in blood and urine values and cytology in disease. The skills dealt with in Laboratory Procedures I continue to be practised and evaluated in the lab component of this course. Terminal performance in laboratory techniques should demonstrate observance of principles and good manual skills.

Winter semester — 4 lecs and 4 labs per week.

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## Description of Courses

### **AS50: Dairy Production**

Instructor: **Prof. Fredeen**

*Prerequisites:* AS20, B20, AS34

Deals with management of dairy animals, and the production of dairy products. Lectures and laboratories cover breeding, feeding, housing, marketing, processing, and economics.

Winter semester — 3 lecs and 2 labs per week.

### **AS51: Beef and Sheep Production**

Instructors: **Profs. Farid and Lirette**

*Prerequisites:* AS20, B20, AS34

Deals with the objectives and methods of producing beef cattle and sheep, both from an industry viewpoint and (at greater length) from the viewpoint of the individual producer. There is practical emphasis, with visits to outside herds as well as use of the College animals.

Winter semester — 3 lecs and 2 labs per week.

### **AS52: Swine Production**

Instructor: **Prof. Anderson**

*Prerequisites:* AS20, B20, AS34

A study of swine production, both as an industry and as a major farm enterprise. The economic swine production unit is the framework for the course, with studies in the practical aspects of reproduction, feeding, breeding, and management integrated to maximize the operation of the swine enterprise as a whole.

Winter semester — 2 lecs and 4 labs per week.

Text — *Alberta Agriculture Alberta Swine Production Home Study Course*,

### **AS53: Poultry Production**

Instructor: **Prof. Crober**

*Prerequisites:* AS20, B20, AS34

This course covers the principles and procedures relating to the production and marketing of poultry meat and eggs, including operation and management. Practical aspects are emphasized.

Fall semester — 2 lecs and 4 labs per week.

### **AS55: Fur Production**

Coordinator: **Prof. A. Hawley**

*Prerequisites:* AS20, AS34, B20

Covers the principles and procedures relating to the production and marketing of fur, including the operation and management of fur ranches in the Atlantic region. Emphasis is on practical aspects.

Winter semester — 2 lecs and 2 labs per week.

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## Description of Courses

### **AS59: Veterinary Laboratory Techniques III**

Coordinator: **Prof. Ramsay**

*Prerequisites:* AS49, AS80, AS81, AS82 (Replaces AS85)

This course provides the opportunity for final refinement and evaluation of clinical laboratory skills. The techniques learned elsewhere in the program are re-evaluated, and students are expected to have reached graduate level performance upon completion of this course.

Winter semester — 3 lec and 3 labs per week. Was changed - Fac. Council 1990

### **AS65: Project-Seminar**

Coordinator: **Prof. Firth**

Provides an opportunity to examine, in detail, specific agricultural topics of interest to the students. Projects are organized and carried out by the students under the supervision of various staff members. Students are required to start their projects at the beginning of the fall semester.

Winter semester — 2 labs per week.

### **AS71: Laboratory Animal Care II**

Instructor: **To be announced**

*Prerequisites:* AS37, AS24

This course is designed to prepare Animal health Technology (AHT) students to successfully complete the Canadian Association for Laboratory Animal Science provisional registration examination. The student will be instructed in special procedures involved in the maintenance and operation of an animal care facility. This will include: environmental control, monitoring animal health, maintaining animal and facility records, and procurement of feeds, supplies, and animals. Students are required to complete assigned periods of duty in the College's animal facility. Introductory techniques in laboratory animal anaesthesia and surgery are covered. This course stresses compliance with the Canadian Council on Animal Care Guidelines.

Winter semester — 4 labs per week.

### **AS75: Animal Nursing and Clinical Procedures III**

Instructor: **To be announced**

*Prerequisite:* AS80, AS81 (Replaces AS85)

Under overall guidance of the clinical instructor, final-year students will supervise second-year students in their clinical periods. Exercises in the operation of computer management systems for veterinary practices are performed by students on phantom practices in the computer laboratory. Successful completion of this course implies graduate level competence in all pertinent skills.

Winter semester — 3 lecs and 4 labs per week.

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## Description of Courses

### **AS80: Externship – AVC**

Coordinator: **Prof. Ramsay**

Permission of the Department of Animal Science is required.

This course is conducted at and by the Atlantic Veterinary College (AVC) at the University of Prince Edward Island.

Students are given training in clinical and non-clinical areas at AVC. Precise scheduling may vary from year to year. A rotation through the Diagnostics Division and various parts of the Veterinary Teaching Hospital (VTH) is followed. This typically includes such assignments as: Small Animal and Large Animal Medicine, Surgery and Anaesthesiology; Theriogenology, Pharmacy, Central Supply Room, and the Ambulatory Clinic.

Students work with and learn from AHTs and other para-professional staff at AVC. Accommodation and special clothing is provided by the College, but other expenses are the responsibility of the student. A percent mark is assigned.

Spring Semester of Year II — April to June (8 weeks).

### **AS81: Externship – Veterinary Practice**

Coordinator: **Prof. Ramsay**

Permission of the Department of Animal Science is required.

Externship experiences are arranged through the College at approved private veterinary practices. Students and externship locations are matched through a process similar to employment applications. During the course the student gains experience on a variety of clinical and relevant administrative procedures related to the provision of Animal Health services.

The student-trainee normally works for a salary. A credit for satisfactory performance is assigned.

Summer or Fall of Year III — July to Sept or Sept to Dec (8 weeks)

### **AS82: Externship – Institutional**

Coordinator: **Prof. Ramsay**

Permission from the Department of Animal Science is required.

Externship experiences are arranged through the College at approved institutions that deal with animals in health, science, research, teaching, or medicine. Students and externship locations are matched through a process similar to employment applications. During the course the student gains experience on a variety of animal research procedures, or institutional procedures related to the provision of Animal Health services.

Typical locations for this externship include: universities and colleges, research establishments, veterinary pathology laboratories, pharmaceutical companies,



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## Description of Courses

humane societies, and pounds. The AHT student is expected to perform technical tasks on the job and function in general as an employed AHT.

The student-trainee normally works for a salary. A credit for satisfactory performance is assigned.

Summer or Fall of Year III — July to Sept or Sept to Dec (8 weeks)

### ***AS90: Technology Project***

Coordinator: ***Prof. Anderson***

This project provides an opportunity for the students to study in detail an Animal Science topic of special interest. This must be a new topic, but may build on other aspects of the study program. The student pursues studies under a project supervisor. The project plan developed with the advisor must include the purpose of study, the procedures and materials used, a time schedule for the work involved, the method in which the information will be collected, the way in which comparisons and conclusions will be developed, and the format for the final report. Both a written and an oral report will be required. The mark is normally reported in the student's final semester, but studies should commence early in the first semester.

Time to be announced.

### ***AS95: Animal Health Technology Project***

Coordinator: ***Prof. Ramsay***

*Corequisite:* Enrollment in the final semester of AHT Program, eligible to graduate if all courses passed in this semester.

This project is intended to be of a technical and/or minor research nature and allow the student to demonstrate skills, planning ability, and the attention to detail required in project work. The details are worked out with faculty in the program, but essentially the semester's work in this course is intended to result in a paper of suitable quality for presentation to other AHT students. A product from the project is expected that is to be of value as a teaching or informational aid. The project may be shared, in which case students who collaborate must show clearly defined duties within the group working on the project.

Winter semester — 1 lec and 4 labs per week.

### ***AS100: Introductory Animal Science (A)***

Instructor: ***Prof. Firth***

The principles of animal science and commercial animal agriculture. Applications of animal science are considered (genetics, reproductive physiology, nutrition, products), and guest lectures describe livestock management and welfare. Labs illustrate the operation of animal industries in Atlantic Canada.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### **AS205: Introductory Animal Production (A)**

Instructor: **Prof. Lirette**

*Prerequisite:* AS100

A study of the principles and systems of efficient production from agricultural species, with emphasis on those of particular importance to the Atlantic Region. This is not a credit course for students majoring in Animal Science.

Fall semester — 3 lecs and 3 labs per week

### **AS 240 The Horse: Its Biology and Use (A)**

Instructor: **Prof. Tennessen**

*Prerequisite:* Second-year standing or equivalent

This course is an introduction to the behaviour, anatomy, nutrition, and history of horses. What behaviour principles underly horse training? How is their performance influenced by their confirmation? What is unique about their digestive system? How did horses evolve? Sources and treatment of illness and disabilities, and the biology and control of common parasites will be discussed. Students will have demonstrations of English and Western riding, but will not be taught to ride. Students will also visit the Truro Raceway, study the importance of shoeing to the working horse, and be exposed to the use of horses as draft animals.

### **AS300: Animal Physiology (A)**

Instructor: **Prof A. Hawley**

*Prerequisites:* AS100, B110

*Preparatory:* CS205

The systems within the body and the functioning of these systems are studied. Through this course, the student should develop a fundamental understanding of the integrated physiological processes responsible for normal body function.

Fall semester — 3 lecs and 3 labs per week.

### **AS305: Animal Nutrition (A)**

Instructor: **Profs. Fredeen and Anderson**

*Prerequisite:* CS200

*Preparatory:* CS205

A study of the principles of nutrition, including the digestion, absorption, and metabolism of nutrients by domestic animals. Functions of protein, lipids, carbohydrates, vitamins, and minerals are studied.

Fall semester — 3 lecs and 2 labs per week.

Text — Maynard, Loosli, Hintz, Warner, *Animal Nutrition*.

### **AS310: Animal Breeding (A)**

Instructor: **Prof. Patterson**

*Prerequisites:* B200, MP200

The course covers variation in animal performance and the techniques whereby genetic superiority can be recognized and improved. Goals and programs of improvement are discussed with reference to commercial farm species. The emphasis is on programs in current use but applications of new technologies are included.

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## Description of Courses

Laboratories deal primarily with data collection, analysis, and computer applications.

Fall semester — 3 lecs and 2 labs per week.

### **AS315: Reproductive Physiology (A)**

Instructor: **Prof. A. Hawley**

*Prerequisite:* AS300

A study of the physiology of reproductive processes in animals and birds. Areas discussed include endocrinology, gamete production, reproductive cycles, control mechanisms, reproductive behaviour, artificial insemination, modification of reproduction, embryo transfer, and subfertility.

Winter semester — 3 lecs and 2 labs per week.

### **AS320: Animal Health (A)**

Instructor: **Dr. Semple**

*Prerequisites:* AS100, B225

*Preparatory:* CS205

Seeks to impart an understanding of animal health and its importance in livestock production enterprises. Students are taught to recognize signs of health and ill-health and to understand the principles and practices of disease prevention and treatment. Conditions of disease and ill-health common in Atlantic Canada are studied. The need for veterinary collaboration is emphasized, and the circumstances in which this should be sought are discussed.

Winter semester — 2 lecs and 2 labs per week.

### **AS325: Applied Animal Nutrition (A)**

Instructor: **Prof. Fredeen and Anderson**

*Prerequisite:* AS305

Feedstuff classification, characteristics, and regulations governing their use are described. Methodology for evaluating the relative merits of typical feedstuffs is discussed. The principles of nutrition are applied in the formulation of rations for monogastric, avian, and ruminant species.

Winter semester — 3 lecs and 2 labs per week.

Text — Church, *Livestock Feeds and Feeding*.

### **AS335: Environmental Physiology (A)**

Instructor: **Prof. Tennessen**

*Prerequisite:* AS300

A study of animals in relation to their environment. The influence of environmental factors on body processes and their relationship to productive efficiency in intensive production systems are examined. Major topics include temperature regulation and body homeostasis, biological rhythms, photoperiodism, and environmental and hormonal interrelationships.

Winter semester — 2 lecs and 2 labs per week.



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## Description of Courses

### **AS340: Animal Behavior (A)**

Instructor: **Prof. Tennessen**

*Corequisite:* AS300

A study of the behaviour of farm animals, including poultry. Topics covered include domestication, learning and conditioned response, animal communication, agonistic and social behaviour, reproductive and maternal behaviour, behaviour modification, development of behaviour, genetics of behaviour, the influence of management systems and practices on behavioural characteristics, and the relationship between behaviour and performance.

Fall semester — 3 lecs and 2 labs per week.

### **AS345: Eggs and Dairy Products (A)**

Instructor: **Prof. Firth**

*Prerequisites:* AS100, B225, CS200 or consent of the instructor

The nature and composition of eggs and milk and their products such as cheese and yogurt. Hygiene, processing and storage.

Fall semester — 2 lecs and 2 labs per week.

### **AS350: Meat Science (A)**

Instructor: **Prof. Firth**

*Prerequisites:* AS100, CS200, B225 or consent of the instructor

Growth of meat animals and the nature of muscle, bone, and fat. Conversion of muscle to meat. Quality and grading of fresh meat; hygiene and storage. Meat processing, meat products, and byproducts.

Winter semester — 2 lecs and 2 labs per week.

### **AS360: Avian Biology (A)**

Instructor: **Prof. Crober**

*Prerequisites:* AS100, CS200, B200, B240

This course is a study of topics in biology of special relevance to the commercial use of avian species. Physiological, biochemical, and genetic control and manipulation of such processes as reproduction, growth and development, and immunity are examined.

Fall semester — 3 lecs and 2 labs per week.

**AS400 to AS430:** These courses deal with application of the sciences of genetics, physiology, nutrition, and behaviour to farm animals. Management systems that apply and integrate these sciences for maximum production and economic return are examined. Courses include studies of the individual species industries in the Atlantic Provinces, Canada, and the world. The resources for production and marketing, and the efficiency of animals as producers of human food, are examined and compared.

*Prerequisites:* AS300, AS305, AS310



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## Description of Courses

### **AS400: Dairy Production (A)**

Instructor: **Prof. Fredeen**

Fall semester — 3 lecs and 2 labs per week.

Text — Schmidt and Van Vleck, Principles of Dairy Science

### **AS405: Swine Production (A)**

Instructor: **Prof. Anderson**

Fall semester — 3 lecs and 3 labs per week.

Text — English, Fowler, Baxter and Smith, *The Growing and Finishing Pig; Improving Her Efficiency*.

### **AS415: Beef Production (A)**

Instructor: **Prof. Lirette**

Winter semester — 3 lecs and 3 labs per week.

### **AS420: Sheep Production (A)**

Instructor: **Prof. Farid**

Fall semester — 3 lecs and 2 labs per week.

### **AS425: Poultry Production (A)**

Instructor: **Prof. Crober**

Winter semester — 3 lecs and 3 labs per week.

Text — North, Commercial Chicken Production Manual.

### **AS430: Fur Animal Production (A)**

Instructor: **Prof. A. Hawley**

Winter semester — 2 lecs and 2 labs per week.

### **AS449: Project-Seminar I (A)**

Instructors: **Animal Science Faculty**

*Prerequisite:* Animal Science major in final year or consent of the instructor.

Animal Science majors in their final year select, in consultation with a faculty advisor, a research topic. This topic is investigated and reported orally and in a written report. Other topics of current interest are also presented and discussed in the weekly seminar period.

Fall semester — 2 labs per week.

### **AS450: Project-Seminar II (A)**

Instructors: **Animal Science Faculty**

*Prerequisite:* AS449

Winter semester — 2 labs per week.

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## Description of Courses

### Biology

#### ***B01: Pre-Tech Biology***

Instructors: ***Mr. Fergus*** and ***Mr. Giles***

An introduction to the basic principles of plant and animal biology that are most important to agriculture. Topics include plant structure and function, growth and reproduction, plant nutrition, animal anatomy and function, animal systems, animal nutrition, photosynthesis, introductory genetics, and introductory ecology.

Winter semester — 3 lecs and 4 labs per week.

#### ***B15: Animal Anatomy***

Instructor: ***Prof. Crosby***

A study of vertebrate anatomy, with emphasis on laboratory, farm, and companion species. The clinical significance of anatomical structures will be stressed.

Fall semester — 2 lecs and 4 labs per week.

#### ***B20: Animal Physiology***

Instructor: ***Prof. Eaton***

Designed to provide a basis in the knowledge of animal physiology as it applies to farm animals. The course includes topics on blood and circulation, digestion and absorption, excretion, respiration, and reproduction, as well as a brief consideration of the skeletal and muscular systems.

Fall semester — 3 lecs and 2 labs per week.

#### ***B25: Histological Techniques***

Instructor: ***Prof. Crosby***

An introduction to slide preparation. Laboratory work will include temporary and permanent slide preparation; preparation of smears, squashes, whole mounts, and sections; introduction to paraffin and plastic embedding techniques; use of microtome and ultramicrotome; and an introduction to various staining techniques.

Winter semester — 2 lecs and 5 labs per week.

#### ***B35: Ecological Techniques***

Instructor: ***Prof. Nams***

An introduction to ecological techniques pertinent to the study of the biosphere. Lectures will cover absolute and relative techniques of population estimates.

Laboratory work will include practical applications of useful sampling techniques. Attributes of valid data acquisition will be illustrated and organization of data in view of analysis will be reviewed.

Fall semester — 2 lecs and 4 labs per week.

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## Description of Courses

### **B40: Plant Pathology**

Instructor: **Prof. Gray**

An introductory course dealing with the nature, cause, and control of plant diseases due to infectious and noninfectious agents. Included are discussions on the infection process, resistance mechanisms, and the effects of environment on disease development, as well as the safe use and handling of fungicides to control important diseases in the region.

Winter semester — 2 lecs and 3 labs per week.

### **B41: Plant Physiology**

Instructor: **Prof. Eaton**

Deals with plant structure and function, as well as plant growth, development, and reproduction. Various plant processes, such as photosynthesis, respiration, absorption and nutrition, water movement, transpiration, and growth, are studied. Topics of importance to agriculture, such as growth regulators, photoperiodism, and dormancy, are also considered.

Winter semester — 3 lecs and 3 labs per week.

### **B43: Entomology**

Instructor: **Prof. Le Blanc**

An introduction to the study of the phylum Arthropoda, with particular reference to the class Hexapoda (Insecta), emphasizing some insect pests of Atlantic Canada. Anatomy, physiology, taxonomy, behaviour, and ecology of insects are considered during lectures and laboratory work. Discussions on the relation of insects to man, basics of insect control methods, and pesticide safety are included.

Fall semester — 2 lecs and 2 labs per week.

Text — Pfadt, *Fundamentals of Applied Entomology* (4th edition).

### **B45: Biology Practicum I**

Instructor: **Biology Faculty**

*This course is available only to Biology Technology students.*

This course is designed to provide an opportunity for Biology Technology students to develop a basic understanding of, and practical experience in, selected techniques in laboratory and field biology.

Fall semester — 6 labs per week.

### **B46: Weed Science**

Instructor: **Prof. Sampson**

Deals with the principles of weed science in relation to agricultural practices in the region. Included are discussions on weed recognition and chemical and non-chemical approaches to controlling weeds in vegetable, fruit, and grain crops, as well as in lawns and non-crop areas. Selection, safe use, handling, and storage of herbicides are stressed.

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## Description of Courses

Winter semester — 3 lecs and 3 labs per week.

### **B48: Plant Tissue Culture**

Instructor: **Prof. Olson**

*This course has limited enrollment.*

An introduction to the basic methods of initiation and maintenance of plant tissues in sterile culture. *In vitro* propagation, callus formation, and cell suspensions are among the general topics to be discussed. In addition, the course will provide a basic understanding of the structure and organization of plant cells, tissues, and organs.

Winter semester — 3 lecs and 3 labs per week.

### **B55: Food Microbiology**

Instructor: **To be announced.**

*Prerequisite:* B225

A study of microorganisms involved in the production and processing of food products. Topics will include the use of microorganisms for food production and processing, food spoilage and potential for food poisoning, as well as sanitation procedures, including government regulations and standards for the food industry.

Winter semester — 3 lecs and 4 labs per week.

### **B60: Biology Practicum II**

Instructor: **Biology Faculty**

*This course is available only to Biology Technology students.*

Biology Practicum II is a continuation of Biology Practicum I. It is designed to provide an opportunity for Biology Technology students to develop a basic understanding of, and practical experience in, selected techniques in laboratory and field biology.

Winter semester — 6 labs per week.

### **B75: Biological Photography**

Instructor: **Prof. Le Blanc**

*This subject has limited enrollment.*

A practical introduction to the production of publication-grade still photographs for use in technical books, articles, and reports. Basic black-and-white photography from processing to mounting, photomacro- and photomicrography, as well as darkroom management are considered. This course requires the preparation of a final portfolio and includes a theoretical midterm examination.

Winter semester — 2 lecs and 4 labs per week.

Texts — Birnbaum, *Black-and-White Dark Room Techniques*, Kodak Publication KW-15, New York, 1986; White, *Close-up Photography*, Kodak Publication KW-22, New York, 1984.



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## Description of Courses

### **B100: Botany (S)**

Instructor: **Prof. Olson**

An introductory course in plant biology. Topics discussed include plant form and function, procaryotic and eucaryotic cells, cell division, alternation of generations, and classification. The diversity of plants in the kingdoms Monera, Protista, Fungi, and Plantae is stressed.

Fall semester — 3 lecs and 4 labs per week.

### **B110: Zoology (S)**

Instructor: **Prof. Crosby**

A general introduction to zoology. Topics include animal cells and tissues, animal form and function, reproduction and development, evolution, and the diversity of both the Animalia and Protista.

Winter semester — 3 lecs and 4 labs per week.

### **B200: Cell Biology (S)**

Instructor: **Prof. Crosby**

An introduction to cell biology. Topics include cell metabolism, the structure and function of organelles of the eucaryotic cell, cell growth, cell movement, and the procaryotic cell. Specialized cell functions will also be discussed.

Fall semester — 3 lecs per week.

### **B225: Microbiology (S)**

Instructor: **Prof. Stratton**

*Preparatories:* B100, B110

A general introduction to microbiology. Topics include history, morphology, structure, cultivation, reproduction, metabolism, genetics, classification, and control of microorganisms. The importance of microorganisms to soil productivity, foods, industry, veterinary science, public health, and sanitation is discussed. Students are required to have a laboratory coat.

Winter semester — 3 lecs and 3 labs per week.

### **B240: Genetics I (S)**

Instructor: **Prof. Atlin**

Study of heredity and variation in plants and animals, including man; the relationships of genetics to evolution and breeding practices.

Fall semester — 3 lecs and 2 labs per week.

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## Description of Courses

### **B245: Genetics II (A)**

Instructor: **Prof. Atlin**

*Prerequisite:* B240

A study of the genetic basis for plant and animal improvement including population and molecular genetics.

Winter semester — 3 lecs and 2 labs per week.

### **B260: Plant Physiology (S)**

Instructor: **Prof. Eaton**

A study of the different functions of the plant, including growth, photosynthesis, mineral nutrition, water relations and translocation of solutes, and plant orientation, development, and reproduction.

Winter semester — 3 lecs and 3 labs per week.

### **B265: Systematic Botany (S)**

Instructor: **Prof. Olson**

*Preparatory:* B100 or equivalent

The general principles and concepts of vascular plant systematics with emphasis on the angiosperms are examined. Botanical nomenclature, methods used in plant identification, classification schemes, sources of taxonomic evidence, and the evolution of major taxa are among the topics presented in the lectures. The laboratory focuses on the recognition of certain local taxa and provides experience in the collection, identification, and preparation of herbarium specimens from the local flora. Students planning to enroll in this course are expected to make a collection of pressed plants during the preceding summer.

Fall semester — 3 lecs and 3 labs per week.

Texts — Roland and Smith, *Flora of Nova Scotia*; Smith, *Vascular Plant Families*.

### **B270: Structural Botany (S)**

Instructor: **Prof. Olson**

The basic morphology and anatomy of the seed plants are presented from a developmental perspective. The structural aspects of the various modes of plant reproduction are also included. The emphasis of the course is placed on obtaining an understanding of plant structure that will complement crop physiology, weed biology, and plant pathology.

Winter semester — 3 lecs and 3 labs per week.

### **B300: Principles of Plant Pathology (A)**

Instructor: **Prof. Gray**

Deals with the principles of plant pathology and the control of diseases caused by bacteria, fungi, mycoplasma-like organisms, viruses, and nematodes. Labs deal with simple techniques used in plant pathology, such as fungal, bacterial, and nematode isolation, identification, and inoculation.

Fall semester — 3 lecs and 3 labs per week.

## Description of Courses

### **B305: Economic Plant Pathology (A)**

Instructor: **Prof. Gray**

*Prerequisite:* B300

An in-depth study of the important plant diseases representative of the major groups of pathogens with particular attention to diseases affecting field crops, fruit and vegetable crops, turfgrasses, and greenhouse crops. Labs deal with advanced techniques used in plant pathology, such as ELISA for virus identification, R-PAGE for viroid identification, TLC for mycotoxin identification, and preparation of materials for scanning electron microscopy.

Winter semester — 3 lecs and 3 labs per week.

### **B310: Mycology (S)**

Instructor: **Prof. Gray**

*Prerequisite:* B100

An introductory course dealing with the morphology, taxonomy, ecology, and physiology of the members of the Fungus kingdom.

Fall semester — 3 lecs and 3 labs per week.

### **B320: General Entomology (S)**

Instructor: **Prof. Le Blanc**

*Preparatory:* B110

An introduction to the science of entomology from an agricultural perspective. Insect anatomy, physiology, and taxonomy are considered; also included are discussions on insect behaviour, reproduction, life cycles, and population ecology. Basics of monitoring techniques and population dynamics are illustrated.

Fall semester — 3 lecs and 3 labs per week.

Text — Borror et al., *Introduction to the Study of Insects* (6th edition).

### **B325: Economic Entomology (A)**

Instructor: **Prof. Le Blanc**

*Prerequisite:* B320

*Preparatory:* B110

An introduction to the study of economic entomology from an agricultural perspective. Principles of insect control — natural, mechanical, physical, cultural, biological, and legal — are covered. Includes chemical and biochemical control, and insecticide development, formulation, and application. This course stresses the theory of integrated pest management (IPM).

Winter semester — 3 lecs and 3 labs per week.

### **B330: Ecology (S)**

Instructor: **Prof. Nams**

*Prerequisite:* B100, B110

An introduction to the principles and general concepts of ecosystem structure and function is presented. The dynamics of populations and community interactions are

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## Description of Courses

considered in relation to various biotic and abiotic environmental influences. The laboratory reinforces various topics covered in the lectures and readings by emphasizing the importance of field observation and interpretation.

Fall semester — 3 lecs and 3 labs per week.

### ***B335: Weed Science (A)***

Instructor: ***Prof. Sampson***

*Prerequisite:* B100

*Preparatory:* B260

Deals with the principles of weed science in relation to agricultural practices in the region. Included are discussions on weed recognition, chemical and non-chemical approaches to controlling weeds in vegetable, fruit, and grain crops, as well as in lawns and non-crop areas. The selection, safe use, handling, and storage of herbicides are stressed, along with the environmental impact of the different methods of weed control.

Fall semester — 3 lecs and 3 labs per week.

### ***B340: Comparative Vertebrate Anatomy (S)***

Instructor: ***Prof. Crosby***

*Prerequisite:* B110

An introduction to comparative anatomy. Emphasis is placed on analyzing vertebrate structure. Comparisons of form and function within the Vertebrata are discussed with an evolutionary perspective. This is supplemented in the laboratory by detailed dissections of representative vertebrates.

Fall semester — 3 lecs and 4 labs per week.

### ***B345: Applied Weed Science (A)***

Instructor: ***Prof. Sampson***

*Prerequisite:* B335

Deals with principles of weed science from an ecological perspective. Included are discussions on ecology and management of weeds in traditional agroecosystems as well as in low-input sustainable agricultural systems. The role of biological, cultural, and chemical control in these systems will be stressed. Biorational approaches to weed control and the role of biotechnology in development of new weed control systems, including herbicides, will be included in discussions.

Winter semester — 3 lecs and 3 labs per week.

### ***B350: Ecological Methods (S)***

Instructor: ***Prof. Nams***

*Prerequisites:* B330, MP200

An introduction to selected methods pertinent to the study of ecological populations. Topics will include sampling techniques, dispersion studies, estimates of population density, population dynamics, systems analysis and modelling, as well as the



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## Description of Courses

construction of energy budgets. Laboratory and field work will include practical data acquisition, organization, and computerized statistical analysis.

Winter semester — 3 lecs and 4 labs per week.

### ***B360: Environmental Analysis (S)***

Instructor: **Prof. Stratton**

*Prerequisites:* B200, B225, CS205

A study of the analytical techniques and instrumentation used to measure and quantify biological processes in the environment. These will include techniques such as microscopy, photomicroscopy, gas chromatography, high pressure liquid chromatography, electrophoresis, and genetic engineering.

Fall semester — 3 lecs and 4 labs per week.

### ***B365: Environmental Impact (S)***

Instructor: **Prof. Stratton**

*Prerequisites:* B330, B360

An introduction to the study of environmental toxicity and ecotoxicology as they are used to predict the environmental impact of agricultural, industrial, and other xenobiotics and associated processes. The laboratory portion of the course will deal primarily with bioassay techniques.

Winter semester — 3 lecs and 4 labs per week.

### ***B385: Principles of Pest Management (A)***

Instructor: **Biology Department Faculty**

*Prerequisites:* B100, B110

An investigation of the philosophy of pest management. Topics will include the study of different approaches to pest management and an assessment of the use of single versus integrated pest control options. Costs of pest control from economic, social, and environmental perspectives will be discussed. This course cannot be taken for credit by students in the Plant Protection major or Plant Science option.

Fall semester — 3 lecs and 3 seminar periods per week.

### ***B400: Soil Microbiology (A)***

Instructor: **Prof. Stratton**

*Prerequisites:* B225, CS220

A study of the biology of the various classes of microorganisms in soil, including bacteria, blue-green algae, fungi, algae, protozoa, and viruses. This course includes details of biochemical transformation of carbon, nitrogen, sulfur, and phosphorous, as well as pesticides and wastes in the environment.

Fall semester — 3 lecs and 4 labs per week.

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## Description of Courses

### **B405: Pesticides in Agriculture (A)**

Coordinator: **Prof. Sampson**

*Preparatories:* B300, B320, B335

A course dealing with various aspects of pesticides used in agriculture. The course will look at pesticides from their origin and development to their registration, sale, distribution, and use. Also included are discussions of safety and toxicology.

Winter semester — 3 lecs and 3 discussion periods per week.

### **B430: Ecology of Agriculture (A)**

Instructor: **Prof. Nams**

*Prerequisite:* B330

Agricultural production systems are examined from an ecological perspective. Students acquire an understanding of the interactions and dynamics of the major components of agroecosystems. The possible modification and application of ecological principles to problem solving in local and global food production are emphasized.

Winter semester — 3 lecs and 3 labs per week. First offered 1992-93.

### **B449: Project-Seminar I**

Instructors: *Department of Biology Faculty*

Co-ordinator: **Prof. Eaton**

An introduction to independent research and effective communication for final year students of both majors of the Agribiology Option. Students will acquire skills in written and oral scientific communication, library use, and information retrieval. Each student will design and implement an individual research project, including data acquisition and analysis, and will begin the process of communicating result in both oral and written form. The research topic and advisor(s) are chosen by the student in cooperation with the course coordinator.

Fall semester — 2 lecs and 4 labs in three two-period blocks.

Text — Day, *How to Write and Publish a Scientific Paper - CBE Style Manual*.

### **B450: Project-Seminar II**

Instructors: *Department of Biology Faculty*

Co-ordinator: **Prof. Eaton**

A continuation of B449. Students will prepare and perform an oral presentation on a biology topic of their choice early in the semester. They will conclude their projects and represent their findings near the semester in three formats: poster presentation, scientific seminar, and written paper.

Winter semester — 2 lecs and 4 labs in three two-period blocks.

## Description of Courses

### Chemistry and Soil Science

#### **CS01: Pre-Tech Chemistry**

Instructor: **Prof. Hawley**

An introductory course emphasizing measurement in chemistry, matter and energy, atomic structure, electronic arrangement of the atom, and chemical bonding. The periodic table is studied, and considerable emphasis is placed on the use of symbols, formulae, equations, and reactions. Some time is also spent on chemical kinetics, problem solving, solutions and electrolysis, and acid-base reaction.

Winter semester — 3 lecs and 3 labs per week.

Text — Seese and Daub, *Basic Chemistry* (6th edition).

#### **CS12: Principles of Soil Science**

Instructor: **Prof. Miller**

Designed to form a basis for the understanding of soil productivity. The course investigates the physical, chemical, and biological properties of soil. Laboratory exercises, using soils from the Atlantic region, are designed to illustrate the lecture material and introduce methods of soil analysis.

Fall semester — 3 lecs and 2 labs per week.

#### **CS13: Soil Management**

Instructor: **Prof. Miller**

*Prerequisite:* CS12

A study of the chemical, physical, and biological properties of soil as they relate to crop production. Soil fertility and fertilizer use, tillage and water management, and biological husbandry are discussed. Labs take the form of problem-solving tutorials in soil management.

Winter semester — 3 lecs and 2 labs per week.

#### **CS14: Agricultural Chemistry**

Instructor: **Prof. Hawley**

Stresses the application of basic chemistry to the agricultural industry. Topics include chemical arithmetic; protection chemicals; sewage disposal; explosives; energy; iron; useful materials from the earth, sea, and air; chemurgy; water; metallurgy; nuclear chemistry; and chemical hazards. Students are also introduced to organic chemistry and applied biochemistry and are taught to identify carbohydrates, proteins, fats, oils, and the vitamins, enzymes, hormones, and nucleic acids.

Fall semester — 3 lecs and 2 labs per week.

Text — Jones et al., *Chemistry and Society* (5th edition).

#### **CS30: Chemical Calculations**

Instructor: **Prof. Hawley**

A course designed to provide the skills needed to carry out chemical calculations associated with chemistry laboratory techniques. Specific topics include: moles,

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## Description of Courses

percentages, concentration of solutions, dilutions, stoichiometry, pH, weak acids and bases, buffers, and recovery experiments.

Fall semester — 3 lecs per week.

### **CS40: Food Laboratory Methods**

Instructor: **Prof. Crowe**

A laboratory course that familiarizes the students with testing methods used specifically in the food industry. Students will be exposed to the theory and practical aspects of sampling, sample preparation, analyses, and data interpretation.

Winter semester — 3 lecs and 4 labs per week.

Text — Pomeranz and Meloan, *Food Analysis: Theory and Practice* (2nd edition).

### **CS42: Organic Chemistry**

Instructor: **Prof. Payne**

An introductory course designed to familiarize the student with the theories and principles of organic chemistry as they apply to certain basic classes of organic compounds, including alkanes, alkenes, alkynes, polyolefins, aromatic hydrocarbons, alcohols, and mercaptans. The nomenclature of these classes of compounds and their application to plant and animal life are stressed. Laboratory procedures are correlated with lecture material; modern procedures and techniques are employed to illustrate the preparation, extraction, purification, and properties and reactions of various organic compounds discussed.

Fall semester — 3 lecs and 4 labs per week.

Text — Fessenden and Fessenden, *Fundamentals of Organic Chemistry*.

### **CS43: Bio-Organic Chemistry**

Instructor: **Prof. Payne**

*Prerequisite:* CS42

A continuation of the introduction to the basic classes of organic compounds. Aldehydes, ketones, amines, carboxylic acids, and their derivatives are studied. The student is also introduced to biochemistry through a preliminary study of carbohydrates, lipids, proteins, nucleic acids, vitamins, hormones, and enzymes. Laboratory exercises closely parallel the topics presented in lecture and are designed to make the student aware of the properties and reactions characteristic of the organic and biochemical compounds studied.

Winter semester — 3 lecs and 4 labs per week.

Text — Fessenden and Fessenden, *Fundamentals of Organic Chemistry*.

### **CS50: Introduction to Physical Chemistry**

Instructor: **Prof. Hoyle**

*Prerequisites:* CS100, MP100

An introductory course that includes a study of gas laws, kinetic theory of gases, thermodynamics, the liquid and solid states, phase changes, chemical equilibrium, nonelectrolyte solutions, colloids, electrochemical cells, chemical kinetics, and photochemistry.



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## Description of Courses

Fall semester — 3 lecs and 4 labs per week.

### **CS55: Quality Control and Consumer Acceptance**

Instructor: **Prof. Crowe**

The design and implementation of quality control programs will be covered. The effect of raw material, material handling, storage, processing parameters, packaging, and warehousing on quality will be studied. Nutritional labelling, product regulations, and the role of the various food enforcement agencies will be discussed. Students will also become familiar with some of the factors affecting consumer acceptance. They will gain experience with some of the basic sensory evaluation techniques used in product development.

Winter semester — 3 lecs and 3 labs per week.

### **CS68: Introductory Laboratory Techniques**

Instructor: **Prof. Payne**

An introduction to general laboratory techniques, safety, and chemical calculations and to problems associated with solution and classical chemical analysis. Techniques include: massing, pipetting, titrimetry, extracting, digesting, colorimetry, and TLC.

Fall semester — 3 lecs and 4 labs per week.

Texts — Shuger et al., *Chemical Technicians Ready Reference Handbook* (3rd edition); American Chemical Society, *Safety in Academic Chemistry Laboratories* (5th edition).

### **CS69: Introductory Instrumentation**

Instructor: **Prof. Brewster**

*Prerequisite:* CS68

An introduction to the practical basic skills of the more commonly used instrumental methods of analysis and the chemical calculations and problems involved in these analyses. The areas covered are: chromatography, radioisotopes, atomic absorption, and flame photometry.

Winter semester — 2 lecs and 4 labs per week.

### **CS73: Laboratory Organization and Management**

Instructor: **Prof. MacConnell**

Students are instructed in lab design and operation, ordering of supplies, organizing data and records, supervising staff, and WHMIS safety regulations. Students are challenged to apply their technical knowledge to the workplace and to gain an understanding for their role as lab technologists.

Winter semester — 2 lecs and 4 labs per week.

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## Description of Courses

### **CS75: Basic Food Chemistry**

Instructor: **A. Havard**

*Prerequisites:* CS42, CS43

A study of the chemistry and technology of carbohydrates, fats, and proteins. Attention is directed towards the basic principles involved in their determination in foods and feeds. The laboratory deals with the qualitative and quantitative physical and chemical techniques used in the analysis of foods and feeds.

Fall semester — 3 lecs and 4 labs per week.

Text — Meyer, *Food Chemistry*.

### **CS79: Project Organization**

Coordinator: **Prof. Payne**

A chemistry project organized on an individual basis with each student.

Fall semester — 6 to 8 labs per week as assigned.

### **CS80: Project Implementation**

Coordinator: **Prof. Payne**

A seminar program with subject matter related to material covered in CS79 project.

Winter semester — 6 to 8 labs per week as assigned.

### **CS85: Food Laboratory Practicum**

Coordinator: **Prof. Crowe**

This Food Lab Practicum is designed to provide the students with hands-on experience and instruction in a typical workplace setting. In their third year of the Food Lab Technology program, students will spend September to December in this practicum. Wherever possible, students will be placed with cooperating food industries most closely in line with their interests. Prospective employers of the Food Lab Technology students could include dairies, wineries, breweries, product development and quality control laboratories, as well as firms involved in the processing of meat, fish, vegetables, fruits, and cereals. In addition to this practicum, students are encouraged to pursue summer employment within the food industry.

Fall semester

### **CS100: Chemical Principles(S)**

Instructor: **Prof. MacConnell and Prof. Hawley**

*Prerequisite:* University Preparation Grade XII Chemistry (N.S.441 or 442, N.B.121 or 122)

A study of atomic theory, periodicity, chemical reactions, thermochemistry, geometrical forms of molecules, chemical equilibrium, and oxidation-reduction reactions. Also included is an extensive study of the chemistry of solutions of weak electrolytes.

Fall semester — 3 lecs and 4 labs per week.

Text — McQuarrie and Rock, *General Chemistry* (3rd edition).

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## Description of Courses

### **CS110: Organic Chemistry(S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS100

A study of basic classes of organic compounds, including alkanes, alkynes, petroleum and petrochemicals, aromatic compounds, alcohols, aldehydes, ketones, alkyl halides, monocarboxylic acids, acid anhydrides, salts, amides, ethers, and amines.

Winter semester — 2 lec, 1 tutorial, and 4 labs per week.

### **CS200: Biochemistry I (S)**

Instructor: **Prof. Robinson**

*Prerequisite:* CS110

This course consists of a study of biological elements, buffers, amino acids and peptides, proteins, lipids, membrane structures, carbohydrates, nucleic acids, and enzymes.

Fall semester — 3 lecs and 4 labs per week.

Text — Voet and Voet, *Biochemistry*.

### **CS205: Biochemistry II (S)**

Instructors: **Profs. MacConnell, Payne, and Robinson**

*Prerequisite:* CS200

Includes a study of enzyme kinetics, mechanisms of enzyme action, vitamins and coenzymes, digestion and absorption, bioenergetics, catabolism of carbohydrates, lipids and nitrogen compounds, selected biosyntheses, nitrogen fixation, and metabolism control mechanisms.

Winter semester — 3 lecs and 4 labs per week.

Text — Voet and Voet, *Biochemistry*.

### **CS210: Advanced General Chemistry**

Instructor: **Prof. MacConnell**

*Prerequisite:* CS100

This course covers several concepts of chemistry at an advanced level: these include theories of the chemical bond, the solid and liquid state, energy changes, chemical kinetics, electrochemistry, complex compounds, periodic trends for the elements and representative compounds. The laboratory portion of the course will include qualitative analysis.

Fall Semester — 3 lecs and 4 labs per week.

Text — McQuarrie and Rock, *General Chemistry* (3rd edition).

### **CS215: Advanced Organic Chemistry (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS110

This course will cover advanced topics in organic chemistry. These will include an in-depth study of organic reaction mechanisms, reactions of heterocyclic compounds and the pathways of decomposition of organic compounds. Other advanced organic

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## Description of Courses

chemical topics such as nuclear magnetic resonance spectroscopy, mass spectrometry, and the use of isotopes in organic chemistry will be covered depending upon the interests of students enrolled in the course.

Fall semester — 3 lecs and 4 labs per week.

### **CS220: Introduction to Soil Science (A)**

Instructor: **Prof. Brewster**

*Prerequisite:* CS100

General principles of soil science relating to the origin, development, and classification of soils; the biological, physical, and chemical properties of soils; and their relation to proper soil and crop management, land use, and soil conservation.

Fall semester — 3 lecs and 4 labs per week.

Text — Miller and Donahue, *Soils: An introduction to soils and plant growth* (6th edition).

### **CS225: Quantitative Analytical Chemistry (S)**

Instructor: **Prof. MacConnell**

*Prerequisite:* CS100

This course includes evaluation of analytical data; preparation of samples for analysis; wet chemistry methods; UV-visible spectrophotometry; and the use of an autoanalyzer.

Winter semester — 3 lecs and 4 labs per week.

Text — Harris, *Quantitative Chemical Analysis* (3rd edition).

### **CS230: Introduction to Geology (A)**

Instructor: **Prof. Brewster**

Topics of this course are: materials of the earth, structure of the earth, and plate tectonics and landscape development. Geological factors important in soil formation will be stressed. Labs include mineral and rock identification, topographic map interpretation, and a field trip.

Winter semester — 3 lecs and 3 labs per week.

Text — Thompson and Turk, *Modern Physical Geology*.

### **CS300: Physical Chemistry I (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS210

General principles of physical chemistry will be studied. These will include chemical kinetics and equilibrium, classical and statistical thermodynamics, diffraction methods, introductory quantum theory, and photochemistry. In addition, there will be a strong emphasis on the use of computers to solve physical chemical problems.

Fall semester — 3 lecs and 4 labs per week. (Next offered 1994-95)



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## Description of Courses

### **CS305: Instrumental Analytical Chemistry (S)**

Instructor: **Prof. Crowe**

*Prerequisites:* Recommend CS225, and either CS110 or CS42

Introduction to the basic theory underlying important techniques in instrumentation chemistry. Design of instruments, operation, and applications will be studied. Laboratory work will include experiments in soils, plant and biological tissue, food, drugs, and vitamins. Instruments in the field of absorption and emission spectrophotometry, chromatography, and electrochemistry will be studied.

Fall semester — 3 lecs and 4 labs per week.

### **CS310: Radiotracers in Agriculture (A)**

Instructor: **Prof. Robinson**

*Prerequisites:* CS200 or CS43, and MP100

*This course has limited enrollment.*

Intended to set forth the concepts of radioactivity necessary for the practical use of radiotracers in agriculture, the course covers radiation theory; radiation counting; sample preparation techniques for counting; applied tracer techniques in soil, plant, and animal studies; isolation and identification of isotope label; and localization of label in a molecular structure.

Winter semester — 3 lecs and 4 labs per week.

Text—Wang, Willis, Loveland, *Radiotrace Methods in the Biological, Environmental and Physical Sciences*.

### **CS320: Soil Fertility (A)**

Instructor: **Prof. Warman**

*Prerequisite:* CS220

*Preparatory:* B260

Includes essential plant nutrients in the soil, influence of soil chemical and physical properties on nutrient absorption and plant growth, methods of evaluating soil fertility and composition, and use of organic and inorganic sources of nutrients.

Winter semester — 3 lecs and 4 labs per week.

Text — Tisdale, Nelson and Beaton, *Soil Fertility and Fertilizers*.

### **CS325: Soil Genesis and Classification (A)**

Instructor: **Prof. Brewster**

*Prerequisites:* CS220

Examination of the theories and principles of soil formation with emphasis on the environmental forces of climate, vegetation, parent material, time, and man upon soil development. A study of soil properties important in the characterization, genesis, and classification of soils. A detailed examination of classification principles and systems presently in use with particular emphasis upon the Canadian system and its relationship to other systems now in use. There is a mandatory field component.

Fall semester — 3 lecs and 4 labs per week.

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## Description of Courses

### **CS335: Soil Physics (A)**

Instructor: **Prof. Miller**

*Prerequisites:* CS220 and MP105

*Corequisite:* MP220 or MP222

A study of the physical properties of soil and the physical processes taking place in soil. This course will investigate the solid, liquid, and gaseous phases of soil, their interrelationships, and their effects on plant growth. The major portion of the course will deal with the mechanisms, measurement, and mathematical description of the storage and movement of water in soil.

Winter semester — 3 lecs and 4 labs per week.

### **CS340: Soil Chemistry (A)**

Instructor: **Prof. Warman**

*Prerequisite:* CS220

Chemical composition of soils; soil acidity, alkalinity, and salinity; ion exchange, oxidation, and reduction; clay minerals and organic matter — composition and transformations; soil pollution; methods of soil chemical analysis.

Winter semester — 3 lecs and 4 labs per week. Next offered in 1993-94.

### **CS345: Soil Conservation in Agriculture (A)**

Instructor: **Prof. Miller**

*Prerequisite:* CS220

A study of the processes of soil degradation and its prevention or amelioration. A major part of the course concerns the erosion of agricultural soils and its control. Other topics include soil compaction and soil acidification, soil reclamation, use of soil in waste recycling, and the role of soil in water conservation. Lab periods may be used for field trips, tutorials, or seminars.

Fall semester — 3 lecs and 3 labs per week.

### **CS350: Food Chemistry (A)**

Instructor: **A. Havard**

*Prerequisites:* CS225, CS305, and either CS200 or CS75

A study of the functions of the basic group compounds found in foods. The subject matter includes the functions of water, carbohydrates, lipids, proteins, enzymes, vitamins, minerals, and food additives in foods and their relationship to food characteristics and quality. An introduction to food preservation methods is also included. The laboratory section of the course will involve the use of instrumentation for the analytical determination of various food constituents. This course cannot be taken for credit by students who have a credit in CS351.

Winter semester — 3 lecs and 4 labs per week.

Text — Fennema, *Food Chemistry* (2nd edition).

## Description of Courses

### **CS351: Food Chemistry (A)**

Instructor: **A. Havard**

*Prerequisite:* CS200

A study of the functions of the basic group compounds found in foods. The subject matter includes the functions of water, carbohydrates, lipids, proteins, enzymes, vitamins, minerals, and food additives in food and their relationship to food characteristics and quality. An introduction to food preservation methods is also included. This cannot be taken for credit by Agricultural Chemistry majors or by students who have a credit in CS350.

Winter semester — 3 lecs per week.

Text — Fennema, *Food Chemistry* (2nd edition).

### **CS360: Mammalian Biochemistry (S)**

Instructor: **Prof. Robinson**

*Prerequisites:* AS300, CS205

A study of how basic biochemical principles are applied to gain insight into the molecular functions of the diverse mammalian organ systems. The subject matter is divided into three parts: (1) Body Fluids and Their Constituents, which includes such subjects as blood coagulation, the complement system, the immune system, and their control; (2) Specialized Tissues, such as connective tissue, nervous tissue, and muscle tissues; and (3) Biochemistry of the Endocrine System, with the focus on the principles of endocrine biochemistry and the mechanisms of hormone action. The topics covered include general principles and mechanisms of hormone action, prostaglandins, the thyroid gland, the gonads, as well as the hypothalamus, hypophysis, and adrenals.

Winter semester — 3 lecs per week.

Text — Smith et al., *Principles of Biochemistry: Mammalian Biochemistry* (7th edition).

### **CS370: Instrumental Food Analysis (S)**

Instructor: **Prof. Crowe**

*Prerequisites:* CS305 and CS110 or CS42

*Corequisite:* CS350

This course, which complements CS305 and CS350, emphasizes use of instrumental techniques to analyze food constituents and residues. Included are the flavour, colour, and texture of foods. The chemical and nutritional safety of foods will also be discussed. The laboratory section will incorporate types of instrumental analysis not studied in CS305 or CS350.

Winter semester — 3 lecs and 4 labs per week.

### **CS415: Special Topics in Chemistry and Soil Science I (A)**

Instructors: **Chemistry and Soil Science Staff**

An optional course for Agricultural Chemistry and Soil Science students who want to study a special topic. Course material will be arranged with Chemistry and Soil Science faculty. The course will be conducted by special tutorials, assigned readings,



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## Description of Courses

and independent lab work where appropriate. This course will normally be taken by students in their final year.

Fall or winter semester — as arranged.

### **CS420: Organic Environmental Analysis (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS205

*This course has limited enrollment and is offered in alternate years.*

The course will involve the study of the analytical chemical techniques used in the analysis of environmental samples obtained from the atmosphere, hydrosphere, and lithosphere. Included in this study will be sampling methods used for air, water, soil, food, and wastes and modelling of environmental contamination. In addition, government regulations, hazard assessment, and public awareness of these issues will be discussed.

Fall semester — 2 lecs and 4 labs. Next offered in 1994-95.

### **CS425: Special Topics in Chemistry and Soil Science II (A)**

Instructors: **Chemistry and Soil Science Staff**

*Prerequisite or corequisite:* CS415

An optional course for Agricultural Chemistry and Soil Science students who want to do a second in-depth study of a special topic in their final year. The topic selected by a student may be in a similar area of interest to that studied in CS415 but must pertain to a distinctly different aspect of that field of Chemistry or Soil Science. Course material will be arranged with Chemistry and Soil Science faculty. This course will involve special tutorials, assigned readings, and independent lab work where appropriate.

### **CS430: Soil Survey and Land Evaluation (A)**

Instructor: **Prof. Brewster**

*Preparatory:* CS325

Principles of the field study and mapping of soils as well as the more general land evaluation techniques, including land classification based on inherent characteristics, present land use/land cover, and land capabilities for alternative uses. Preparation of soil, land use, and other interpretive maps in association with the interpretation of aerial photographs and methods of soil cartography. There is a mandatory field component.

Fall semester — 3 lecs and 4 labs per week. Next offered 1994-1995.

### **CS449: Project-Seminar I (A)**

Coordinator: **Prof. Warman**

A required course for all Agricultural Chemistry and Soil Science students. Each student will be assigned a research project requiring library and laboratory investigative procedures. Each student will present periodic oral reports and a written



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## Description of Courses

report on the subject of investigation. Other written and seminar topics may be assigned.

Fall semester — 1 scheduled seminar session per week.

### ***CS450: Project-Seminar II (A)***

Coordinator: ***Prof. Warman***

A continuation of CS449. Students will continue with their projects and will present an undergraduate thesis as well as a final conference-style seminar presentation. Other assignments may be given.

Winter semester — 1 scheduled seminar session per week.

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## Description of Courses

### Economics and Business

#### ***EB01: The Agricultural Industry***

Coordinator: ***C. Crewe***

Major emphasis is placed on information about the agricultural industry, rather than on specific agricultural topics or skills. The course is organized into four majors (segments): Animal Science, Plant Science, Agricultural Business, Agricultural Mechanization.

Winter semester — 2 lecs and 4 labs per week.

#### ***EB10: Accounting***

Instructor: ***Prof. Arnfast***

An introduction to accounting topics useful to managers. Topics include recording transactions, forms of business organization, cash and accrual basis of accounting, financial statements, internal control, payrolls, bank reconciliation, and types of accounting systems, with an introduction to microcomputer applications.

Fall semester — 3 lecs per week.

#### ***EB11: Applied Accounting and Taxation***

Instructor: ***Prof. Arnfast***

*Prerequisite:* EB10

The basic principles and procedures relevant to the accounting function of a business. Topics discussed include recording business transactions, year-end adjustments, and preparation of financial statements. Considerable time will be spent on Canadian income tax.

Winter semester — 3 lecs and 2 labs per week.

#### ***EB12: Macroeconomics***

Instructor: ***Mrs. Gallant***

An introduction to the study of macroeconomics in a Canadian context. Topics covered include national accounts, public finance, money and banking, and international trade. Current problems in the Canadian economy are examined to emphasize the theory.

Fall semester — 3 lecs per week.

#### ***EB13: Microeconomics***

Instructor: ***Mrs. Gallant***

An introduction to the theory of the firm. The course examines the theory of demand and supply, distribution of income, forms of business organizations in Canada, and the levels of competition in the agricultural industry. Application of the various theories to explain the agricultural industry is stressed.

Winter semester — 3 lecs per week.

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## Description of Courses

### **EB40: Marketing Practices**

Instructor: **Prof. Russell**

Preparatory: EB13

Current practices involved in marketing farm products produced in the Atlantic Provinces are studied. The conditions affecting these practices and the groups of people that can bring about changes are identified. Special attention is paid to consumer behaviour, supplier behaviour, market structures, price determination, marketing boards, and marketing commissions.

Fall semester — 2 lecs and 3 labs per week.

### **EB41: Business Law**

Instructor: **Prof. Arnfast**

Introduces several legal topics relevant to the management of a business. Topics discussed are: legal structure in Canada, Law of Torts, contracts, sale of goods, consumer protection legislation, creditors, employment, forms of business organization, insurance, and real estate.

Winter semester — 3 lecs per week.

### **EB42: Applied Farm Management**

Instructor: **Prof. Tait**

Designed to transfer classroom teaching to real farm situations. Students have an opportunity to apply the principles of farm management on production farms. Some of the requirements involve analyzing farm records, credit analysis, developing farm plans, and evaluating machinery, livestock, and crop decisions, based on actual farm cases.

Winter semester — 2 lecs and 4 labs per week.

### **EB65: Business Project**

Coordinator: **Prof. Tait**

An opportunity to examine, in detail, specific agricultural topics of interest. Projects are organized and carried out by the students under the supervision of various staff members.

Fall semester — 5 labs per week.

### **EB70: On-Farm Training**

Coordinator: **Prof. Tait**

The seven-month training takes place on a commercial production unit where the student is under the direct supervision of the farmer. Emphasis is placed on having the student involved in all facets of the operation, with particular attention to financial management. Each student is expected to take part in selecting his/her training farm. Whenever possible the farm will be in the province chosen by the student. The final grade in the course is based on the student's performance in several topic areas (financial, production, and specific skills) as determined by both the farmer and the coordinator.

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## Description of Courses

May – November at the end of the second year.

### **EB72: Farm Project**

Coordinator: **Prof. Tait**

The farm project relates the course program to the on-farm training. It stresses the application of information to a specific farm situation. For this project, the farm may be the home farm or any other farm. An intimate knowledge of the farm is necessary. The student, therefore, must have access to the farm and to detailed information about it.

The prepared project consists of three sections: an analysis of the present farm operation, including a detailed inventory of land, buildings, machinery, and all other farm resources; an outline of the student's objectives and projected plans for the farm; and a practical step-by-step (year-by-year) program for the changes necessary to reach these goals.

The farm project is introduced in the first technology year, before the beginning of the seven months of on-farm training. All the required data for the farm inventory are collected during the on-farm training period. The final work on the prepared project is done in the last college semester. Though most of the work is done outside of the scheduled class time, one afternoon per week is scheduled for special instruction and for presentations. Each student is required to present a minimum of one seminar on his or her farm plan to the project class and the instructor committee.

Winter semester — 5 labs per week.

### **EB90: Technology Project**

Coordinator: **Prof. Tait**

This project provides an opportunity for the students to study in detail an Economics and Business topic of special interest. This must be a new topic, but may build on other aspects of the study program. The student pursues studies under a project supervisor. The project plan developed with the advisor must include the purpose of the study, the procedures and materials used, a time schedule for the work involved, the method by which the information will be collected, the way in which comparisons and conclusions will be developed, and the format for the final report. Both a written and an oral report will be required. The mark is normally reported in the student's final semester, but studies should commence early in the first semester.

Time to be announced.

### **EB110: Agricultural Economics (A or E)**

Instructor: **Prof. Russell**

This course is designed to introduce students to the structure and organization of agriculture and economic theory as it applies to agriculture. The course strives to make the agricultural reality more understandable for all students, regardless of major, and provides the necessary background for more advanced agricultural economics, agri-business and economics courses.

Winter semester — 3 lecs per week.



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## Description of Courses

### **H140: Personnel Management (E or H)**

Instructor: **Mrs. Jones**

An introduction to the human side of business organizations. The course focuses on the challenges of motivation, recruitment, and selection, performance evaluation, compensation, and labour-management relations.

Winter semester — 3 lecs per week.

### **EB200: Microeconomics I (E)**

Instructor: **Prof. Stackhouse**

*Prerequisites:* EB110, MP100

Introduces the principles of neoclassical microeconomic theory using graphical and mathematical analysis. Areas of emphasis include: the competitive market model, measurement and interpretation of elasticities, the theory of consumer preferences, and the theory of production.

Fall semester — 3 lecs per week.

### **EB205: Microeconomics II (E)**

Instructor: **Prof. Stackhouse**

*Prerequisites:* EB200, EB260

A continuation of the principles presented in Microeconomics I. This course examines the theory of the firm under perfect and imperfect market conditions, and general equilibrium of production and exchange. The principles contained in this course are presented using graphical and mathematical analysis.

Winter semester — 3 lecs per week.

### **EB210: Financial Accounting I (E)**

Instructor: **Prof. Arnfast**

A study of the basic principles and procedures relevant to the accounting function of a business firm. Topics discussed include recording transactions, adjusting entries, and preparing financial statements; accounting for a merchandising concern; accounting systems with emphasis on microcomputer; accounting for cash, credit sales, and accounts receivable; inventories; and cost of goods sold, plant, and equipment.

Fall semester — 3 lecs and 2 labs per week.

### **EB215: Financial Accounting II (E)**

Instructor: **Prof. Arnfast**

*Prerequisite:* EB210

Continues the study of financial accounting with emphasis on special topics and reporting of accounting information. Includes a brief introduction to income tax.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### ***EB220: Production Economics (E)***

Instructor: ***Prof. Tait***

An introduction to the study of economic principles used to analyze production and resource use in agriculture. Areas of emphasis include economic examination of the factor-factor, factor-product, and product-product relationships of the farm production system. Practical examples and lab exercises are used to illustrate and reinforce the concepts presented in the classroom.

Winter semester — 2 lecs and 4 labs per week.

### ***EB260: Mathematical Economics (E)***

Instructor: ***Prof. Stackhouse***

*Prerequisites:* MP100, EB110

Introduction to the frequently used mathematical methods of economic analysis. The course provides the student with the basics required in more advanced economics courses. Areas of concentration include: elements of mathematical economics models, linear models and matrix algebra, applications of calculus to economic problems, and optimization theory.

Fall semester — 3 lecs per week.

### ***EB310: Cost Accounting (E)***

Instructor: ***Prof. Russell***

*Prerequisite:* EB210

An introduction to the uses of accounting data for managers. Areas of emphasis include planning, control, and decision making.

Fall semester — 3 lecs and 1 tutorial per week.

### ***EB325: Operations Research (E)***

Instructor: ***Prof. Stackhouse***

*Prerequisite:* EB260

An introduction to mathematical programming. Major emphasis is placed on linear programming and the role of matrix algebra in determining linear programming solutions. The information requirements, organization, and skills of model building are also developed.

Winter semester — 4 lecs and 1 lab per week.

### ***EB330: Agricultural Markets and Prices (A)***

Instructor: ***Prof. Grant***

*Prerequisite:* EB205

Designed to introduce students to agricultural market and price analysis. In general, course topics include econometric estimation of supply and demand relationships for agricultural commodities, applications of price theory, and discussion of pricing institutions in the agricultural industry.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### ***EB335: Business Marketing (E)***

Instructor: ***Prof. Russell***

Designed to introduce basic marketing principles and their application to marketing problems. Topics such as promotion, pricing, distribution, and marketing research are examined. The case method of instruction is used extensively. Class participation is a vital component of this course.

Fall semester — 3 lecs and 2 labs per week.

### ***EB340: Farm Management I (A)***

Instructor: ***Prof. Tait***

Principles and methods of organizing and analyzing farm businesses are examined. Practical problems associated with financial analysis, planning, capital budgeting, resource use, and credit acquisition are included. The role of the farm manager is identified throughout.

Fall semester — 2 lecs and 4 labs per week.

### ***EB355: Macroeconomics I (E)***

Instructor: ***Prof. Russell***

An introduction to the study of macroeconomics. The course is designed to acquaint the student with the main elements of macroeconomic theory. Emphasis is placed on the application of theories to current Canadian economic problems. Topics covered include national income analysis, monetary policy, and fiscal policy.

Winter semester — 3 lecs per week.

### ***EB360: Econometrics (E)***

Instructor: ***Prof. Clark***

*Prerequisites:* EB260, MP200

An applied course in statistics and economic theory using the classical linear regression model. Topics covered include a review of probability theory, estimation and specification of single and simultaneous equation models, violations of the assumptions of the classical linear model, hypothesis testing, and tests of significance. Exercises illustrating the statistical concepts developed in the lectures and applications of econometric techniques to agricultural economics problems and economic theory are provided and fully explained in the labs.

Fall semester — 3 lecs and 2 labs per week.

### ***EB400: Resource and Environmental Economics (A)***

Instructor: ***Prof. Clark***

*Prerequisite:* EB205

Advanced microeconomics applied to issues of environmental quality and resource use. Topics include welfare economics, market failure, externalities, pricing of renewable and non-renewable resources, and cost-benefit analysis.

Fall semester — 3 lecs per week.

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## Description of Courses

### ***EB405: Macroeconomics II (E)***

Instructor: **Prof. Grant**

*Prerequisite:* EB355

Development of an integrated aggregate model of the Canadian economy, which includes consideration of money, product, and labour markets, and aggregate demand and supply.

Winter semester — 3 lecs per week.

### ***EB415: Business Law (E)***

Instructor: **Mr. Hunt**

An introduction to general principles of law relating to the management of a business. Major areas studied are torts and contracts. Specialized topics include forms of business organizations, sale of goods, conditional sales, real property, mortgages, insurance, and wills.

Fall semester — 3 lecs per week.

### ***EB420: Agricultural and Food Policy (A)***

Instructor: **Prof. Clark**

*Prerequisites:* EB330, EB400

The course reviews policy problems affecting the agricultural and food industry and examines approaches to solve them. An analysis of Canadian agricultural and food policy and discussion of its main issues are also part of the course.

Winter semester — 3 lecs per week.

### ***EB425: Research Methods (E)***

Instructor: **Prof. Grant**

*Prerequisites:* EB325, EB360

The lectures cover general methodological issues within economics, specific analytical methods utilized by agricultural economists, as well as principles and guidelines for researching and writing fourth-year projects. It is required that progress on the fourth-year project (to be completed in EB450) include a precise statement of the topic, a literature review, a detailed outline, a well-defined methodology, and demonstration of data availability.

Fall semester — 2 lecs and 2 labs per week.

### ***EB440: Farm Management II (A)***

Instructor: **Prof. Russell**

*Prerequisites:* EB325, EB340

An applied course intended to utilize the farm management principles developed in Farm Management I. Students are introduced to computerized farm planning models and are required to apply these methods to actual farm problems.

Winter semester — 2 lecs and 3 labs per week.



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## Description of Courses

### ***EB450: Project-Seminar (E or A)***

Instructors: ***Dept. of Economics and Business Management Faculty***

Coordinator: ***Prof. Grant***

*Prerequisite:* EB425

Under the supervision of faculty, students complete the research projects begun in EB425. The student is required to submit the first draft for evaluation by faculty. The student presents a final report and participates in peer evaluation of the presentations of the other students.

Winter semester — 2 seminars per week.

## Humanities

### ***H01: Language Development***

Instructor: ***Prof. Sanger***

Designed to ensure that pretechnical students have an adequate grounding in grammar, spelling, and punctuation to meet the requirements for admission to H10 Technical Writing; that they get exercise in technical communication; and that they have the opportunity to read and write about Canadian history and literature. The course consists of classroom instruction in grammar, spelling, and punctuation. There is heavy emphasis on the writing of tool and machine descriptions, notetaking, letter writing, and essays. At least two Canadian novels are studied. There is one major term paper and a final examination. H01 is not equivalent to H10.

Winter semester — 3 lecs per week.

### ***H10: Technical Writing***

Instructor: ***Prof. Sanderson***

Objective is to provide instruction in basic scientific report and review paper writing; in grammar and spelling; in business letter writing with specific reference to the employment application letter and resume; and in the cultural, social, and historical background of agriculture and its related trades. Students must write a major term paper. H10 is not equivalent to H100.

Fall semester — 3 lecs per week.

### ***H20: The Human Body and Fitness***

Instructors: ***Profs. Marchant and J. Smith***

Designed to give students a basic understanding of human anatomy and physiology and its relationship to fitness. Emphasis is placed on applied anatomy and kinesiology, as well as on the effects of physical activity on the physiological processes in the human body (exercise physiology). Most lab work takes place in the gymnasium and stresses testing, lifelong recreation activities and their exercise value, and training principles.

Fall semester — 2 lecs and 2 labs per week.

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## Description of Courses

### ***H45: Technical Communications***

Instructor: ***Prof. Sanderson***

This course will focus on improving interpersonal communication skills. It will be designed specifically for students planning careers where contact with the public is essential. This course will deal with such topics as listening and interviewing skills, group dynamics, conflict management, meeting management, and basic teaching skills. Evaluation for the course will be based primarily on projects. This course would be open to all technicians with a maximum of 20 students registered. This course is required for students in the Animal Health Technology program.

Winter semester — 1 lec and 2 labs per week.

### ***H50: Core Language Skills***

Instructor: ***Prof. Sanger***

The objective of the course is to provide basic instruction in writing and reading. Emphasis is placed upon spelling, correct grammar, sentence and paragraph structure, and analysis of methods of presentation and argument. The course is entered by means of an evaluation test administered in H100 during the first week of classes. Instruction is individualized. Students meet the instructor privately by appointment.

This is a non-credit course that does not appear on student transcripts. Those students placed in the course must pass it before being able to take an H300-level course.

### ***H60: Communication Techniques***

Instructor: ***Prof. Sanderson***

*This subject has limited enrollment.*

The purpose of this course is to encourage the development of students' communication skills. The course will concentrate on improving students' speaking skill plus incorporating audio-visual materials. Creative presentation of ideas through exhibits, slide presentations, and video will be a focus of a number of the sessions. Guest speakers in the area of advertising and marketing will be invited. Evaluation for the course will be based primarily on a number of projects such as a slide-tape presentation.

Winter semester — 3 labs per week.

### ***H100: Technical Writing/English and American Authors (H)***

Instructor: ***Prof. Sanger***

The course is divided into four parts. The first deals with library use, with emphasis upon information retrieval systems specific to agriculture and science. The second provides instruction in the writing of scientific reports. The subject of the third is the writing of business letters, with particular attention to job applications. The fourth involves reading a set of texts of relevance to agriculture and science. Students must write a major essay, involving library research on an assigned topic. There is a substantial literary component in this course. Students are expected to study in detail

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## Description of Courses

authors such as Wordsworth, Keats, Coleridge, The Brontes, Melville, Thoreau, or others.

Fall semester — 3 lecs per week.

### **H120: Rural Sociology(H)**

Instructor: **Prof. Beesley**

An introduction to “rural sociology” as a discipline of study through assigned text, selected readings and lectures. The course will explore the nature of “rural” society, social and cultural changes and the role of groups, social class, and organizations. Concepts of rural neighbourhood, community, town, and trade centres will be examined in an Atlantic Canadian context. The role of family, rural institutions, and organizations (especially farm organizations and co-operatives) will be studied. Changes affecting rural communities and primary resource industries will be explored. A section will be devoted to the history of Canadian farm and other rural organizations, how they function, their accomplishments, etc. Sustaining future rural communities will be the final emphasis covered.

Fall semester — 3 lecs per week.

### **H126: Sustainable Rural Communities (H)**

Instructor: **Prof. Beesley**

This course will provide a historical analysis of the development of Atlantic rural farming communities, including a review of the available literature and statistics on rural community development, the nature of rural development and adjustment, and the role of the federal/provincial programs. Rural development programs of the past and alternatives for the future will be studied, with particular focus on Atlantic Canada. The course will be in a seminar format with student participation and involvement, which will include a local community study as the term project to be presented in written form and orally presented to the seminar.

Winter semester — 2-hour seminar, once per week.

### **H130: Introductory French (H)**

Instructor: **J. Couture-Nowak**

**Prerequisite:** Grade 12 High School French or permission of instructor and Head of Department

This course is designed to provide the student with opportunities to actively use the language through various socio-cultural settings and language functions. As part of a communicative approach, a video production component centred on publicity will be integrated in the program.

A variety of culturally relevant authentic materials such as video recordings, audio-cassettes, guest speakers and literature will be used to supplement the textbook and to facilitate learning through reading, writing, and listening skills. This course is designed for Anglophone students or for students whose French is being learned as a foreign language.

Winter semester — 3 lecs per week.



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## Description of Courses

### **H140: Personnel Management (E or H)**

Instructor: **To be announced**

This course is a Humanities elective that is offered by the Department of Economics and Business Management. Please turn to that section of this calendar for a course description.

Winter semester — 3 lecs per week.

### **H150: Agriculture Today (H)**

Instructor: **Prof. Crouse**

The course offers a basic overview of the agricultural industry in the Atlantic Provinces. Production trends and limiting factors, agricultural research, farm organizations, and government role in the industry are studied to provide an awareness and appreciation of Atlantic agriculture, the major things happening in it, and the new technology associated with it. The progress of the local industry and current issues are followed up through weekly reading assignments and class presentations. Commodity updates are presented through student seminars. This is a discussion-based course requiring class participation.

Winter semester — 3 lecs per week.

### **H205: Canadian Studies (H)**

Instructor: **Prof. Sanger**

Objectives of this course are to provide a general survey of Canadian literature from colonial times to the present and to examine specifically four or five 20th-century Canadian novels. Books by Callaghan, MacLennan, Ringuet, Aguin, O'Hagan, Atwood, Buckler, Ethel Wilson, and Davies have been used. Students must write a major term paper. All tests, exams, and written assignments in this course may be carried out in French. Required texts, when available in that language, may be read in French.

Winter semester — 3 lecs per week.

### **H230: Nature's Image: A Survey of Landscape Art (H)**

Instructor: **Ms. Klee-Atlin**

*Prerequisites:* H10 or H100 or by permission of Head of Humanities Department.

This course will provide an introduction to the history of artforms depicting landscape with the major focus being on landscape painting. The course will consist of both art history lectures and a studio component in which drawing techniques, collage, and colour theory will be explored. Students will develop skills in composition and will gain an increased appreciation for landscape art traditions.

3-hour lecture/studio, once per week.

### **H300: History of Agriculture (H)**

Instructor: **Prof. Sanger**

Objective of this course is to examine the development of agriculture from the 17th to the mid-20th centuries. Particular emphasis is placed upon North American changes. Students are encouraged to carry out local historical field work. The course



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## Description of Courses

may involve work with the NSAC Archival and Historic Collections. Students must write a major term paper. This paper is the course's only source of evaluation.

Winter semester — Individual supervision; times arranged by the instructor and student.

### ***H305: History of Scientific and Agricultural Thought (H)***

Instructor: ***Prof. Sanger***

The objective of this course is to examine some of the key texts that have influenced the course of science and agriculture. Emphasis is placed upon the close reading of primary sources, beginning with the classical world of Greece and Rome and extending to the modern world. Among the areas to be examined may be the work of the Pre-Socratics, Plato, Aristotle, Cato, the place of nature and agriculture in medieval society, and the development of biology and physics from the 16th to 20th centuries. One of the main themes of the course will be the nature of scientific discovery and cognition. Another will be the place of humankind in nature. In addition to a final exam, students must either write one major term paper or submit an acceptable journal of natural observations.

Fall semester — 3 seminars per week.

### ***H320: Extension Education in the Rural Community (H)***

Instructor: ***Prof. Sanderson***

*Prerequisite:* 20 degree subjects or approval of the instructor.

The aim of this course is to provide students with a basic understanding of the principles and theories of extension education in rural society. The first part of the course will discuss trends in the rural community that affect the extension education process. Principles and procedures in conducting extension programs will be examined in the second part of the course. Through the utilization of guest lectures and class presentations, past and present extension efforts in the Maritimes will be analyzed in the final section of the course. Students will be required to prepare a major class presentation.

Fall semester — 3 lecs per week.

### ***H325: Technology in Agricultural Communications (H)***

Instructor: ***Prof. Sanderson***

*Prerequisite:* 20 degree subjects including H200, or 12 technical subjects.

Technician students require H10.

This course is designed to provide students with an understanding of the basic concepts involved in communicating ideas in an agricultural setting. The adult as a learner is featured in a discussion of the basic concepts involved in planning adult programs. Emphasis is placed on gaining practical experience in the use of media. Various types of media, such as radio, newspapers, television, and film, are examined. Assignments include preparing advertising or publicity, using photography,

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## Description of Courses

and developing scripts. The term project requires the student to produce an audio-visual presentation with integrated sound track.

Winter semester — 3 lecs and 2 labs per week.

### ***H350: Environmental and Agricultural Ethics (H)***

Instructor: ***M. Campbell***

*Prerequisites:* H100, or by permission of Instructor and the Head of the Humanities Department.

This course offers a general introduction to environmental ethics with emphasis upon agricultural issues. Students will be introduced to modern ethical theory, and to techniques of philosophical reasoning, and will be provided with a general context for overall discussion by examining the origins of the modern world view (the rise of modern science, market economics, and liberalism). Evaluation will be based upon class participation and a series of short weekly essays based upon directed readings and field experience. Essay-style midterm and final exams are required.

Winter semester — 1 seminar, 2 hours per week.

### ***H400: Issues in Agriculture (H)***

Coordinators: ***Prof. Tennessen, Animal Science; Prof. Warman, Chemistry and Soil Science***

*Prerequisite:* 3rd or 4th year standing, or permission of coordinators.

*This course will have a limited enrollment (20).*

This course allows senior students in all disciplines to discuss current topics of interest to agricultural professionals. These topics could include: soil degradation, integrated pest management, antibiotics in feed, uses of biotechnology, the occupation of farming, animal welfare, etc. Students will be given weekly required readings.

Fall semester — 3-period seminar weekly.

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## Description of Courses

### Mathematics and Physics

#### **MP01: Pre-Tech Mathematics**

Instructor: **Mrs. D. Robinson**

Mathematical concepts are applied to problems in agriculture. Topics are mathematical operations, percentage, linear and simultaneous equations, quadratic equations, exponents, logarithms, math of finance, ratio, proportion, and variation. The SI system of units is used.

Winter semester — 2 lecs and 2 labs per week.

#### **MP14: Computational Methods**

Instructor: **Prof. Farmer**

A course to develop problem-solving and decision-making abilities and computational skills, both manual and machine. The course is based around the computer. The problems are of a scientific and managerial nature, emphasizing agricultural applications. The arithmetic and algebraic skills needed for the course are developed as the need arises through self-instructional modules.

Winter semester — 3 lecs and 2 labs per week.

#### **MP15: Introductory Physics**

Instructor: **Prof. Pearson**

A survey course in classical physics, designed to provide technicians with the principles of physics important to the study and practice of agriculture. Content and instruction are at the Grade 12 level. The major areas of study include: concepts of measurement, dynamics, statics, heat theory, and electricity. Certain topics in modern physics will be introduced as time permits. The laboratory sessions consist of student-performed experiments and problem tutorials.

Fall semester — 3 lecs and 2 labs per week.

#### **MP70: Basic Statistics**

Instructor: **Prof. Pearson**

Populations and samples, frequency distributions, sampling theory, tests of hypotheses, linear regression and correlation, analysis of variance, and discussion of experimental designs.

Winter semester — 3 lecs per week.

#### **MP80: Transition Mathematics**

Instructor: **Mrs. D. Robinson**

This is a review of high school mathematics. Topics include manipulation of algebraic expressions, equation solving, linear and quadratic functions, trigonometric functions, graphing, inverse functions and specifically logarithmic and exponential functions, sequences, and series. This course will be conducted on a lecture/tutorial basis.

*This is a non-credit course.*

Fall semester — 4 lecs per week.

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## Description of Courses

### **MP90: Introductory Physics**

Instructor: **Prof. S. Smith**

An introductory course for entering students who do not have the equivalent of Nova Scotia Grade XII Physics. Course topics are mechanics, heat, light, and electricity. The laboratory emphasizes the experimental foundations of physics and allows the student to acquire skills in measurement through practice.

*This is a non-credit course.*

Winter semester — 3 lecs and 4 labs per week.

### **MP100: Calculus and Analytic Geometry I (M)**

Instructors: **Prof Madigan and TBA**

*Prerequisite:* University Preparation Grade XII Mathematics (N.S. 441, N.B. 121 or 122)

A study of limit and the derivative, with maxima and minima, velocity and acceleration, and differentiation of the trigonometric, exponential, and logarithmic functions. Topics from analytic geometry are covered at appropriate stages throughout the course. Students are required to confirm their eligibility for admission to this course by means of a mathematic diagnostic test, to be taken the day following registration. *Students not admitted to this course must take MP80.*

Both semesters — 4 lecs per week.

Text — Stewart, *Calculus*.

### **MP105: Calculus and Analytic Geometry II (M)**

Instructors: **Prof Madigan and TBA**

*Prerequisite:* MP100

A continuation of MP100 dealing mainly with the integral calculus. Both definite and indefinite integrals are studied, with application to areas, volumes, hydrostatic pressure, and work. As in the case of MP100, topics from analytic geometry are covered at appropriate stages of the course.

Both semesters — 4 lecs per week.

Text — Stewart, *Calculus*.

### **MP130: Physics for Life Sciences I (S)**

Instructor: **Prof. S. Smith**

*Prerequisite:* University Preparation Grade XII Physics (N.S. 441, N.B. 121 or 122) or NSAC MP90.

Basic physics principles necessary for the understanding of instrumentation and biophysical topics form the core of the course. Topics include mechanics, motion and force, concepts of energy, pressure, and fluid flow. Calorimetry and heat transfer methods are applied to such topics as the basic metabolic rate and size of an animal.

Fall semester — 3 lecs and 4 labs per week.

Text — Haliday, Resnick, *Physics*.



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## Description of Courses

### **MP135: Physics for Life Sciences II (S)**

Instructor: **Prof. S. Smith**

*Prerequisite:* MP130

A continuation of Physics MP130. The electric charge, field, and potential and simple electric circuits are taken up, and their importance in instrumentation is explored. The magnetic field is included. Elementary optics and optical instruments are studied.

Winter semester — 3 lecs and 4 labs per week.

Text — Haliday, Resnick, *Physics*.

### **MP200: Statistics (M)**

Instructor: **Prof. Pearson**

Descriptive statistics; exploratory data analysis; probability; normal, binomial and chi-square distributions; tests of significance; t and F distributions, linear regression and correlation; sampling; planning of experiments; analysis of variance; means comparison tests.

Winter semester — 3 lecs, tutorial, and computer lab per week.

### **MP220: Computer Science (M)**

Instructor: **Prof. Bishop**

Introduction to problem-solving methods and algorithm development. Emphasis is on designing, coding, debugging, and documenting programs, using FORTRAN.

Fall semester — 3 lecs and 2 labs per week.

### **MP222: Computer Methods (M)**

Instructor: **Prof. Farmer**

A course to develop problem-solving and decision-making abilities and computational skills using computer software. Problems of a scientific and managerial nature will be chosen from a variety of agricultural fields. Topics to be covered consist of word processing, spreadsheets, database, programming, statistics, communications, graphics, and process control. Industry-leading software will be used.

Both semesters — 3 lecs and 2 labs per week.

### **MP230: Multivariable Calculus (M)**

Instructor: **Prof. Kupczynski**

*Prerequisites:* MP100, MP105

Covers vectors, differential calculus of several variables, multiple integration.

Fall semester — 4 lecs and 2 labs per week.

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## Description of Courses

### **MP235: Differential Equations and Linear Algebra (M)**

Instructor: **Prof. Kupczynski**

*Prerequisites:* MP100, MP105

Course covers elementary differential equations, first-order equations, types of second-order equations and solutions, applications to physical problems, vectors and vector products, differentiation, integration, matrices, linear transformations, and eigenvalues.

Winter semester — 4 lecs and 2 labs per week.

### **MP300: Electric Circuits (S)**

Instructor: **Prof. S. Smith**

*Prerequisite:* MP135

Includes theory of circuits and power engineering; DC circuits; AC currents and voltages, phasors and complex algebra; AC circuits; current-voltage; power; frequency response; polyphase circuits; transients; magnetic circuits; si phase transformers; electrical machinery; DC machines; alternators; induction and synchronous motors.

Fall semester — 3 lecs and 2 labs per week.

Text — Irwin, *Basic Engineering Circuit Analysis*.

### **MP320: Statistical Methods (M)**

Instructors: **Prof. Kupczynski and Pearson**

*Prerequisite:* MP200

Covers methods of analysis of variance and covariance, experimental designs, sampling techniques, multiple regression, and correlation.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; next offered in 1994–95.

### **MP330: Agrometeorology (A)**

Instructor: **Prof. S. Smith and Mr. Gordon**

*Prerequisite:* MP130

Introduction to the weather and climate of the Atlantic region. The course will cover the basics of the surface weather systems, the energy balance of crops, and the factors determining the climate of the region. The final phase will look at how weather information is used to predict crop maturity, yield, disease severity, and insect pest levels.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### Plant Science

#### ***PS30: Introduction to Plant Science***

Instructor: ***To be announced***

A survey course to introduce students to the principles and practices involved in the production of crop plants. Labs will give the students an opportunity to become familiar with the skills and techniques involved in growing agronomic and horticultural crops.

Winter semester — 3 lecs and 2 labs per week.

Text — Klein and Klein, *Fundamentals of Plant Science*.

#### ***PS38: Nursery Crop Production***

Instructor: ***Prof. Mapplebeck***

The course examines site selection; types of nurseries; nursery layout, facilities, and equipment; and the production of field-grown and container-grown nursery stock. Proper handling of nursery stock by retailers, and selling of nursery stock through garden centres are also covered.

Winter semester — 3 lecs and 2 labs per week.

#### ***PS39: Greenhouse Crop Management***

Instructor: ***Prof. Mapplebeck***

This course covers site selection, types of greenhouses, heating systems, ventilation, growing media, watering and fertilization, environmental controls in the greenhouse, and the production of bedding plants, pot plants, cut flowers, and greenhouse vegetables. The laboratory section of this course includes visits to commercial greenhouse operations and practical experience in the College greenhouse.

Fall semester — 3 lecs and 2 labs per week.

Text — Nelson, *Greenhouse Operation and Management*.

#### ***PS40: Field Crops I***

Instructor: ***Prof. Martin***

A study of grasses, legumes, and other crops grown for forage or grain; factors influencing adaptation and distribution of these crops. Emphasis is placed on crops and conditions in the Atlantic Provinces.

Fall semester — 3 lecs and 2 labs per week.

#### ***PS41: Field Crops II***

Instructor: ***Prof. Martin***

*Prerequisite:* PS40

A study of the production management of forage and grain crops. Soil conservation and crop rotations will also be assessed. The overall objective is to provide a basis for sound feed-production decisions on livestock farms in the Atlantic region.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### ***PS43: Small Fruit Crops***

Instructor: ***Prof. Ju***

Berry crops studied include strawberries, raspberries, cranberries, blueberries, currants, gooseberries, grapes, and kiwis. All aspects of berry production, from planting to marketing, are covered. Course also includes visits to small fruit farms and certified strawberry nurseries.

Fall semester — 3 lecs and 2 labs per week.

### ***PS44: Tree Fruit Crops***

Instructor: ***Prof. Ju***

The culture and handling of apples, pears, peaches, plums, and cherries. Topics studied are soil management, propagation, training systems, pruning, harvesting, pest control, grafting and budding, storage, and marketing.

Winter semester — 3 lecs and 2 labs per week.

### ***PS47: Turfgrass Production and Management***

Instructor: ***Prof. Daniels***

A study of cool-season turfgrasses, their characteristics, and proper usage. The establishment, maintenance, and renovation of turfgrass will be studied. Cultural topics covered will emphasize proper fertilizing, watering, and pest control.

Fall semester — 3 lecs and 2 labs per week.

### ***PS49: Potato Production***

Instructor: ***Prof. Asiedu***

Cultural practices involved in the production are discussed in relation to the botanical characteristics of the potato plant. Physiological changes involved in sprouting, tuber initiation, crop development, and storage are considered in detail. Seed potato production is given particular attention.

Winter semester — 3 lecs and 2 labs per week.

### ***PS50: Landscape Horticulture I***

Instructor: ***Prof. Goodwin***

An introduction to landscape horticulture, including the history of Old World influences on North American horticulture development. Plant-environment interaction and the fundamental principles governing plant growth are discussed, as well as the functional uses of ornamental plants in the contemporary landscape. Laboratory exercises will concentrate on the basic skills associated with the use of plants in the landscape.

Fall semester — 3 lecs and 4 labs per week.

Text — Walker, Carpenter, *Plants in the Landscape*.



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## Description of Courses

### **PS51: Residential Landscape Design and Construction**

Instructor: **Prof. Higgins**

*Prerequisites:* AE12, PS50, PS60

Residential landscape design and construction are studied. A systematic and practical approach to design is emphasized.

Winter semester — 3 lecs and 3 labs per week.

Text — Hannebeum, *Landscape Design*.

### **PS53: Vegetable Production**

Instructor: **Prof. Goodyear**

Production practices for vegetables grown in the Atlantic region are studied in detail, including botanical and horticultural characteristics, soil and fertility requirements, cultivar selection, pest management, and harvesting and storage. Commercial vegetable enterprises are visited.

Fall semester — 3 lecs and 2 labs per week.

Text: — Peirce, *Vegetables: Characteristics, Production and Marketing*.

### **PS55: Plant Propagation**

Instructor: **Prof. Nowak**

Covers physiological and anatomical basis of plant propagation and techniques of sexual and asexual propagation of agricultural and horticultural crops as well as landscape plant material and herbaceous perennials. Propagation structure, containers, media, and sanitation, pedigreed seed production, and *in vitro* techniques for micropropagation are also components of this course.

Fall semester — 3 lecs and 3 labs per week.

Text — Hartmann, Kester, and Davis, *Plant Propagation*.

### **PS60: Landscape Plant Materials I**

Instructors: **Profs. Higgins, Olson, and Mrs. Murray**

Deciduous trees, shrubs, and vines are studied with respect to their identification and landscape value. The lab involves the study of plant families, plant morphology, use of plant keys, plant collecting, and preparation of herbarium specimens. A plant collection is required.

Fall semester — 3 lecs and 3 labs per week.

Texts — Dirr, *Manual of Woody Landscape Plants*; Roland and Smith, *Flora of Nova Scotia*; Smith, *Vascular Plant Families*.

### **PS61: Landscape Plant Materials II**

Instructors: **Prof. Higgins and Mrs. Murray**

Landscape plant materials are studied with respect to their identification. Broad-leaf and narrow-leaf evergreens, foliage plants for interior plantscapes, annuals, and perennials are studied. Recognition of deciduous trees and shrubs by winter wood characteristics is also covered. Sketching is a component of this course.

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## Description of Courses

Winter semester — 3 lecs per week.

Text — Dirr, *Manual of Woody Landscape Plants*.

### **PS65: Plant Science Project**

Coordinator: **Prof. Nowak**

A study of an agronomic or horticultural topic, which usually includes plant growing experimentation, that the student pursues in much more detail than is possible in lecture or laboratory course presentations. Students are evaluated on initiative in developing the project, on competence in carrying out its practical aspects, and on demonstrated progress towards objectives set when the project is initiated. Both an oral and a written report are required. The work should commence in the fall semester.

Fall semester — 2 lecs per week.

Winter semester — 2 lecs per week.

### **PS70: Landscape Techniques**

Instructor: **Prof. Goodwin**

*Prerequisites:* PS47, PS51

This is a spring semester course. Students will be required to work under contract in the landscape horticulture trade with an approved employer for a period of at least six weeks (240 hrs. minimum). Contract content will include such areas of work as landscape construction, landscape maintenance, plant production, and sales, and will reflect the specialties of the employer.

Summer and fall — 6 weeks.

### **PS71: Arboriculture**

Instructor: **Prof. Goodwin**

*Prerequisite:* PS50

Emphasis is placed on arboriculture theory and practice. Tree problems arising from pest and disease injury, as well as environmental and non-parasitic injury of trees will be addressed. The course will focus on the tree in an urban environment. Laboratory exercises concentrate on specific arboriculture skills and techniques.

Fall semester — 3 lecs and 4 labs per week.

Text — Harris, *Care of Trees, Shrubs and Vines in the Landscape*.

### **PS72: Landscape Maintenance**

Instructor: **Prof. Goodwin**

*Prerequisites:* AE38, PS47, PS50

Provides an overview of site management. Time studies, scheduling of horticultural work, and management techniques are included. Pesticides and their application are discussed, and provincial pesticide applicators exams are written in preparation for licensing. A calendar of landscape maintenance tasks will be developed by the student.

Winter semester — 3 lecs and 2 labs per week.

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## Description of Courses

### ***PS73: Landscape Horticulture II***

Instructor: **Prof. Higgins**

*Prerequisites:* PS51, PS61

A study of herbaceous plants and their uses in landscape. Special plant groups, gardening techniques, and styles will be examined. Plant identification is a component of this course.

Fall semester — 3 lecs and 2 labs per week.

### ***PS74: Landscape Design and Construction***

Instructor: **Prof. Higgins**

*Prerequisite:* PS73

Advanced landscape planning and construction will be discussed. Such topics as site, furniture, decks, roofscapes, interior plantscapes, and estimating are included. Plant identification is an important component of this course.

Winter semester — 3 lecs and 3 labs per week.

### ***PS76: Plant Products Physiology***

Instructor: **Prof. Asiedu**

*Corequisite:* B41

The principles of plant physiology as they apply to plant products in storage environments. Course deals with management practices associated with the harvesting and storage of crops and the effect of time period and conditions of storage on the quality of the plant products. Storage structures are studied and representative types of commercial storages visited.

Winter semester — 3 lecs and 2 labs per week.

### ***PS90: Technology Project***

Instructor: **Prof. Nowak**

This project provides an opportunity for the student to study in detail a Plant Science topic of special interest. This must be a new topic, but may build on other aspects of the study program. The student pursues studies under a project supervisor. The project plan developed with the advisor must include the purpose of the study, the procedures and materials used, a time schedule for the work involved, the method in which the information will be collected, the way in which comparisons and conclusions will be developed, and the format for the final report. Both a written and an oral report will be required. The mark is normally reported in the student's final semester, but studies should commence early in the first semester.

Fall and winter semesters — 2 lecs per week.

### ***PS100: Principles of Crop Production (A)***

Instructor: **Prof. Caldwell**

This is a prerequisite for all Plant Science production subjects. General principles underlying adaptation, improvement, culture, and utilization of agronomic and

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## Description of Courses

horticultural crop plants are studied. Special attention is paid to crops and discussion of principles in relation to the crops grown in the region.

Fall semester — 3 lecs and 2 labs per week.

Text — Barden, Halfacre and Parrish, *Plant Science*.

### **PS147: Farm Woodlot Management (A)**

Instructor: **Mr. Young**

*This course has limited enrollment.*

The farm woodlot resource is described, and management procedures are explained and illustrated. Special attention is given to the procedure and harvesting of saw logs, pulpwood, Christmas trees, fuel wood, and maple sap. Development programs administered by provincial government departments are covered.

Fall semester — 2 lecs and 3 labs per week.

### **PS300: Forage Crops (A)**

Instructor: **Prof. Martin**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Study of principle underlying characteristics, tolerances, requirements, and uses of forage crops, and the production of forage plants for pasture, hay, silage, cover crops, or green manure. Crop rotations will also be assessed.

Winter semester — 3 lecs and 2 labs per week. (Next offered in 1993-94.)

### **PS305: Grain Production (A)**

Instructor: **Prof. Caldwell**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Study of cereals, pulses, oilseeds, and other grains, their classification, adaptation, distribution, culture, improvement, seed production, handling, grading, and utilization.

Fall semester — 3 lecs and 2 labs per week. (Next offered in 1994-95.)

Text — Stoskopf, *Cereal Grain Crops*.

### **PS310: Vegetable Crops (A)**

Instructor: **Prof. Goodyear**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Botanical and horticultural features of major families of vegetable crops. Production technology, pest management, harvesting, and storage requirements of major vegetable crops are studied in detail.

Fall semester — 3 lecs and 2 labs per week. (Next offered in 1994-95.)

Text — Peirce, *Vegetables: Characteristics, Production and Marketing*.



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## Description of Courses

### ***PS315: Tree Fruit Crops (A)***

Instructor: **Prof. Ju**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Origins, history, biosystematics, adaptation, distribution, and culture of tree fruits. Propagation, pruning, training, harvesting and storage, pest control, and breeding of new cultivars and marketing of these crops are included in the course. This course is offered in alternate years.

Winter semester — 3 lecs and 2 labs per week. (Next offered in 1993-94.)

### ***PS320: Small Fruit Crops (A)***

Instructor: **Prof. Ju**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Principles and practices of small fruit production, history, biosystematics, adaptation, distribution, pest control, breeding of new cultivars, and propagation, storage, and marketing are studied. This course is offered in alternate years.

Fall semester — 3 lecs and 2 labs per week. (Next offered in 1994-95.)

### ***PS325: Potato Production (A)***

Instructor: **Prof. Asiedu**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

History, biosystematics, growth, and development of the crop. Culture through seed preparation, sprouting, growth, tuberization, maturation, and storage for seed, table, and processing are studied in detail. Fertility practices and pest management, breeding and use of cultivars, and nutritional qualities of the crops are considered. Production practices in the Atlantic Provinces are examined in detail.

Winter semester — 3 lecs and 2 labs per week.

### ***PS330: Greenhouse Crop Production and Floriculture (A)***

Instructor: **Prof. Mapplebeck**

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Construction and equipment of greenhouses and related structures. Physiological principles involved in the growing and correct timing of vegetables and flower crops are studied and related to commercially viable plant production. Plant nutrition, propagation, and greenhouse management are also considered.

Fall semester — 3 lecs and 2 labs per week. (Next offered in 1993-94.)

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## Description of Courses

### ***PS335: Landscape Plant Production (A)***

Instructor: ***Prof. Mapplebeck***

*Prerequisites:* PS100, B100

*Preparatories:* B260, B265

Production of landscape plant materials is studied in detail. More specifically, this course covers plant propagation techniques, nursery culture and equipment, harvesting, storage, transportation, and garden centre handling and sales of plants. This course is offered in alternate years.

Winter semester — 3 lecs and 2 labs per week. (Next offered in 1994-95.)

### ***PS340: Turfgrass Management Principles and Practices (A)***

Instructor: ***Prof. Daniels***

*Prerequisites:* PS100, B100

A study of the most current practices employed in the production of commercial turf. Emphasis is placed on the scientific principles involved in the maintenance of turf in intensively used areas.

Fall semester — 3 lecs and 2 labs per week. (Next offered in 1994-95.)

### ***PS350: Plant Biochemistry (A)***

Instructor: ***Prof. Nowak***

*Prerequisites:* B260, CS200

A study of plant metabolism in crop management systems. Metabolic regulations in plant cells and their relation to nutrition, use of pesticides, and environmental stresses will be the main focus of this course. Plant-microbial interaction and molecular approaches for the manipulation of developmental processes in plants will also be considered. The course will alternate with PS475 (see Graduate Courses).

Winter semester — (Next offered in 1993-94.)

### ***PS355: Tropical Agriculture (A)***

Instructor: ***Prof. Asiedu***

*Prerequisites:* PS100, AS100, EB110, and CS220

This course will introduce the student to food production, storage, and handling systems in tropical and subtropical countries. The sustainability of these systems and issues that limit the use of the environment for long-term food production will be identified. The instruction will include resource people from several disciplines.

Fall semester — 3 lecs per week.

### ***PS400: Plant Breeding (A)***

Instructor: ***Prof. Atlin***

*Prerequisites:* B240, MP200, one crop production subject

An introduction to the principles and practices of plant breeding, including the genetics of agriculturally important traits, germplasm preservation, breeding biotechnology, and the structure of the Canadian seed industry.

Winter semester — 3 lecs and 2 labs per week. (Next offered in 1993-94.)

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## Description of Courses

### **PS405: Agronomy (A)**

Instructors: **Agronomy Staff**

*Prerequisites:* PS300, PS305 and PS415

The objective is to review and integrate material from prerequisite subjects on field crop production, soils, climate, and basic sciences into crop management systems. Students successfully completing this course will qualify to be identified as agronomists.

Winter semester — 3 lecs per week.

### **PS410: Horticulture (A)**

Instructors: **Prof. Daniels and Horticultural Staff**

*Prerequisites:* PS415, PS449, and three horticultural production courses

The objective is to review and integrate material from prerequisite courses on horticultural crops production, soil, climate, and basic sciences into crop management systems. Students successfully completing this course will qualify to be identified as horticulturalists.

Winter semester — 3 lecs per week.

### **PS415: Crop Adaptation (A)**

Instructor: **Prof. Martin**

*Prerequisites:* Two crop production subjects

*Preparatory:* B330

Crops in relation to environmental influences, such as temperature, light, soil, water, and biotic factors of where crops are grown. Approaches to expanding areas of adaptation and distribution are considered. A term report is required.

Fall semester — 3 lecs and 2 labs per week.

### **PS449: Project-Seminar I (A)**

Coordinator: **Prof. Daniels and Prof. Atlin**

Involves the selection of an appropriate project and the preparation of a research plan to investigate the chosen subject. Fundamentals of experimental design and data analysis are covered in lectures. Under the supervision of a faculty advisor, each student will select a topic, conduct a detailed literature review, and prepare an experimental plan for implementation in PS450. This course is required by all students in the Plant Science option. The research project and faculty advisor are to be chosen in consultation with the course coordinator during Semester VI, and work initiated soon thereafter. This course is required by students in year 3 of the Plant Science option.

Winter semester — 1 lec per week.

### **PS450: Project-Seminar II (A)**

Coordinator: **Prof. Daniels**

*Prerequisite:* PS449

The continuation and conclusion of the subject selected in PS449. This consists of both a written and oral presentation of the project.

Fall semester — 1 lec per week.

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## Description of Courses

### Graduate Courses

**AS475 Ruminant Digestive Physiology and Metabolism** (also listed at Dalhousie University)

Instructors: **Profs. Fredeen and Lirette**

*Prerequisite:* AS300, AS305, CS360

This course is designed to provide an intensive study of the physiology of food intake and digestion, and nutrient absorption and metabolism, in the ruminant animal. The course will detail current knowledge and focus on aspects of future research interest. Students will be expected to contribute to discussions and present reviews to the class on various aspects of the subject. The course is recommended for graduate students and senior undergraduates interested in pursuing graduate studies.

Fall semester — 3 lecs and 2 labs per week. (Offered in alternate years.)

**PS475: Plant Biotechnology (A)** (Also listed at Dalhousie University)

Instructor: **Prof. Nowak**

*This course has a limited enrollment.*

Culture of plant cells, tissues and organs, somatic embryogenesis and organogenesis, screening for pathogen and stress tolerance, and the application of these techniques in plant propagation, virus eradication, and plant breeding. Production of secondary metabolites, germplasm preservation, and genetic manipulations will also be considered. Completion of an assigned project is a part of this course. Graduate students give two additional seminars or prepare one lab.

Winter semester — 2 lecs and 4 labs per week. (Next offered in 1994-95.)

Text — Lindsay and Jones, *Plant Biotechnology in Agriculture*; Dixon, *Plant Cell Culture, A Practical Approach*.



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# Vocational Courses

The Nova Scotia Agricultural College offers pre-employment and upgrading courses for several specific farm and farm-related careers. These may be of varying lengths and offered at different times of the year depending upon the topic(s).

Continuing Education Programs include evening courses, home study courses and professional upgrading courses. In addition, independent study courses are available, and other courses are currently being developed.

Room and board at the Nova Scotia Agricultural College is \$132 per week. Tuition costs vary, depending upon the length of the course and the topics being covered.

The following courses are tentatively planned for the 1993-94 year:

- Accounting and Taxation (Farm)
- Advanced Wordperfect 5.1
- Applying AutoCAD
- Basic Flower Arranging for the Home
- Bedford Accounting
- Dairy Herd Operation
- dBase IV
- Developing a Business Strategy
- Dried Floral Design Workshop
- Effective Business Communications
- Farm Skills
- Farrier (Basic)
- Floral Design
- Garden Centre Merchandising
- Herbicide Use in Integrated Weed Management
- Improving Your Effectiveness
- Increasing Your Effectiveness as a Board Member
- Installation of Modular Pavers
- Introduction to Computer-Aided Drafting
- Introduction to Microcomputers
- Introduction to WordPerfect
- Ironwork
- Keeping Pests and Weeds out of the Lawn and Garden
- Landscape Business Management
- Landscape Construction
- Landscape Design
- Landscape Plants: Planting and Maintenance
- Lotus 1-2-3
- Lotus, Database and Graphics
- Meat Cutting
- Meat Department Management
- Meat Merchandising
- Mink Production

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## Vocational Courses

- On-Farm Computers
- Opportunities for Small-Scale Farming
- Pesticide Safety for Farmers
- Pesticide Safety for Landscapers
- Pesticide Vendors' Course
- Pesticides — Crop Protection, Application, and Safety
- Pet Nutrition
- Planning the Home Landscape
- Pond Culture of Trout
- Poultry Production
- Race Horse Shoeing
- Residential Landscape Design and Construction
- Small Poultry Flock Management
- Swine Herd Operation
- Tree Fruit Production and Marketing
- Turf Production
- Vegetable Production
- Weed Science Principles
- Welding (Basic Farm)

For information on courses offered and costs, contact Vocational and Continuing Education, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia B2N 5E3. Telephone 893-6666.

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# Scholarships and Bursaries

## Entrance Scholarships

### *Degree Scholarships*

#### ***Canada Scholarships***

The federal government's Canada Scholarships Program awards over 2,500 scholarships annually to students entering undergraduate studies in selected natural sciences, engineering, and related disciplines. The scholarship can be worth up to \$8,000, received as \$2,000 annually over four years. Furthermore, outstanding Canada Scholars in their third and fourth years of study in certain disciplines may also be recommended by their faculty to receive an additional award sponsored by the corporate sector. *Deadline for application is June 20.*

For more information, contact your guidance counsellor, university awards office, or:

Canada Scholarships Program Awards Division  
Association of Universities and Colleges of Canada  
151 Slater Street  
Ottawa, Ontario K1P 5N1  
Tel. (613) 563-1236

#### ***Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Degree Programs***

The Nova Scotia Department of Agriculture and Marketing offers entrance scholarships to residents of Nova Scotia accepted for the degree programs with averages of 80% or higher in the subjects required for admission. These scholarships are at two levels:

##### ***\$2,000***

Three scholarships of \$2,000 each are offered annually to students with the highest averages in the subjects required for entrance. All students who apply for admission are considered.

These scholarships are continuous at NSAC for the normal duration of the program. Provided the recipients have maintained the 80% level in the work of the previous year with no failed subjects, \$2,000 will be offered at the beginning of each academic year. For those whose averages at NSAC drop below 80%, but remain above 75%, the amount of the annual scholarship will be \$750.

##### ***\$1,500***

Scholarships of \$1,500 each are offered to all students (except those selected for the \$2,000 level) who are accepted and have averages of 80% or higher in the subjects required for entrance.

These entrance scholarships become continuous for those students who maintain scholarship level at NSAC. For those who maintain an 80% average with no failed subjects, \$1,500 is offered each year for the normal duration of the program. For

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## Scholarships and Bursaries

those whose averages at NSAC drop below 80%, but remain above 75%, the amount of the annual scholarship will be \$750.

### ***The F.W. Walsh Memorial Scholarship***

As a tribute to the memory of the outstanding agriculturalist F. Waldo Walsh, this scholarship of about \$800 is financed from the interest on a fund established in his memory. The scholarship is awarded annually to a student who is admitted to the degree program at NSAC. Academic standing is a major consideration in the selection of the candidate, but financial need and participation in school and community affairs will also be considered. Applications are available from the Registrar's Office, NSAC, Truro, Nova Scotia B2N 5E3. *The deadline for receiving applications is September 17.*

### ***Newfoundland Provincial Scholarships***

The Newfoundland government, through its Department of Education, offers three scholarships of \$1,000 each to Newfoundland students who enter the first year of the B.Sc. (Agr.) or B.Sc. (Agr.Eng.) courses at NSAC with the highest averages in the subjects required for admission. If there are insufficient students admitted to the first year of the program, the remaining scholarship(s) are offered to a student (or students) entering the second and, if necessary, subsequent years with the highest average (or averages). No application is required. The scholarships are presented at Autumn Assembly.

### ***Nova Scotia Institute of Agrologists Scholarship***

The Nova Scotia Institute of Agrologists provides a scholarship of \$1,000 for a resident of Nova Scotia entering one of the degree programs at the Nova Scotia Agricultural College. In awarding the scholarship, the selection committee will take into consideration academic standing, participation in school and community activities, degree of interest in agrology and pursuing a career in the agri-food industry and financial need. Three to five applicants from the total list of applicants will be selected for an interview to be conducted during the first week of classes in September. Applications are available by writing the Secretary, Nova Scotia Institute of Agrologists, P.O. Box 550, Truro, Nova Scotia B2N 5E3. *Applications and transcript marks should be received by August 1.*

### ***Degree and Technical Scholarships***

#### ***Benny Duivenvoorden Memorial Scholarship***

The Benny Duivenvoorden Memorial Scholarship of \$500 is offered by the Eastern Breeders Inc., Atlantic Branch, to a New Brunswick 4-H member who enters a recognized college of agriculture. Applications must be made to the N.B. Central A.B. Co-op, Box 1567, Fredericton, New Brunswick E3B 5H1. *The deadline for applications to be received at this address is August 31.*

#### ***Hank DeBoer Memorial Scholarship***

The Hank DeBoer Memorial Scholarship, with a value of \$500, is offered to a Nova Scotia student who enters any one of the degree or technical programs at NSAC and who receives no other scholarship with a higher value. The selection of the recipient



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## Scholarships and Bursaries

will be based mainly on academic standing. Financial need will be a consideration where two candidates are close in academic standing, and where a difference in need can be established. No application is necessary. The selection of the recipient will be made by the Scholarship Committee of NSAC, and the presentation will be made at Autumn Assembly.

### ***Newfoundland Milk Marketing Board Scholarships***

The Newfoundland Milk Marketing Board provides scholarships valued at \$500 each to a Newfoundland student entering a technical program and a Newfoundland student entering the degree program. No application necessary.

### ***Nova Scotia Agricultural College Alumni Scholarships***

The Nova Scotia Agricultural College Alumni Association offers two scholarships of \$1,000 to worthy students entering the first year of the degree or technician program. Academic standing and financial need are taken into consideration in awarding the scholarships. No application is necessary.

### ***The Woodside Memorial Scholarship***

As a tribute to the memory of Harold and Mary Woodside, formerly of Alderbrook Farm, Margate, P.E.I., two scholarships of \$1,000 each will be awarded annually to P.E.I. students who enter a program at NSAC related to animal science, plant science, or landscaping. The selection of recipients will be based on academic standing, financial need, and participation in sports, school, and community activities. Application forms are available from the guidance counsellor at all P.E.I. senior high schools. *The deadline for receiving applications is August 20.*

### ***Technical Scholarships***

#### ***Canada Scholarships***

The federal government's Canada Scholarships Program awards over 800 scholarships annually to students entering studies in selected technology disciplines. The scholarship can be worth up to \$7000, over three years. *Deadline for application is June 20.*

For more information, contact your guidance counsellor, university awards office, or:

Canada Scholarships Program Awards Division  
Association of Universities and Colleges of Canada  
151 Slater Street  
Ottawa, Ontario K1P 5N1  
Tel. (613) 563-1236

#### ***Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Technical Programs***

The Nova Scotia Department of Agriculture and Marketing offers entrance scholarships of \$500 for all residents of Nova Scotia accepted for the technical programs with averages in the subjects required for admission of 80% or higher. These entrance scholarships become continuous for those students who maintain scholarship level

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## Scholarships and Bursaries

at NSAC. For those who maintain an 80% average with no failed subjects, \$500 is offered for students admitted to the second and third years of their programs.

### ***Co-op Atlantic Bursaries***

Co-op Atlantic offers three bursaries of \$500 each to students entering the technician program. Selection is based on the recommendation of a local cooperative or district Federation of Agriculture, on need, and on potential for community leadership and/or cooperative endeavour. Applications should be sent to the Corporate Secretary, Co-op Atlantic, Box 750, Moncton, New Brunswick E1C 8N5, *no later than August 31*. Recipients of these bursaries are eligible for the same bursaries in their second year provided they forward their first-year marks and confirm their enrollment. The recipients of these scholarships may be offered summer employment with Co-op Atlantic.

## Continuation Scholarships

### ***Degree Scholarships***

#### ***Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Degree Programs***

The Nova Scotia Department of Agriculture and Marketing offers scholarships for all NSAC students who are residents of Nova Scotia and who are admitted to the second, third, or fourth year of the degree programs with averages in the work of the previous year at NSAC of 75% or higher. No application is necessary.

\$1,500 is awarded to all these students with averages in the work of the previous year of 80% or higher and with no failed subjects.

\$750 is awarded to all these students with averages in the work of the previous year of 75% to 80% and with no failed subjects.

### ***A.B. Banks Memorial Scholarship***

A scholarship in memory of the late A.B. Banks, with a value of about \$250, is offered annually to a student who achieves the highest cumulative average at the completion of the first year of the B.Sc. (Agr.) program and who enters the second year of the B.Sc. (Agr.) program in the Animal Science option. No application required.

### ***A.C. Neish Memorial Trust Scholarship***

The A.C. Neish Memorial Trust awards a \$1,400 scholarship to an NSAC student who completes, in a satisfactory manner, the third year of study of the B.Sc. (Agr.) program. The award is tenable at NSAC for a fourth year of study. The selection criteria are high academic standing and qualities of leadership as indicated by participation and achievement in both academic and non-academic activities. *The deadline for applications to be received at the Registrar's Office is September 17.*

### ***Angus and Tena MacLellan Memorial Scholarship***

A bequest from Angus and Tena MacLellan who farmed in Cloverville, Antigonish County, Nova Scotia, provides a \$1,000 scholarship for a student entering the third

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## Scholarships and Bursaries

or fourth year of a degree program. The recipient is to be selected by the Scholarship Committee. No application is required.

### ***Atlantic Farm Mechanization Show Scholarship***

The Atlantic Farm Mechanization Show offers one or more scholarships of approximately \$1,000 total value to students from the Atlantic Provinces who have completed at least one year of studies at the College, and who are currently enrolled in a degree or technical program of Engineering, Mechanization or Farm Equipment. The awarding of the scholarship(s) is based on academic achievement and demonstrated potential for a career in the area of mechanization of agriculture. The award is made on the recommendation of the Agricultural Engineering Department. No application is necessary.

### ***Atlantic Fertilizer Institute Scholarship (Degree)***

The Atlantic Fertilizer Institute offers an annual scholarship, valued at \$1,000, to a student from one of the Atlantic Provinces who is entering the second year in the Plant Science option of the B.Sc. (Agr.) program. The student receiving this scholarship must have a farming background. In selecting the recipient, the Scholarships Committee of NSAC will take into consideration scholastic standing (not necessarily the first priority), participation in student life, contribution to the college community, and financial need. The presentation of this scholarship takes place at Autumn Assembly. Application forms are available at the Registrar's Office, NSAC. *The deadline for receiving applications is September 17.*

### ***Atlantic Land Improvement Contractors Association Scholarship***

An annual scholarship of \$500 has been established by the Atlantic Land Improvement Contractors Association. The scholarship is available to degree Agricultural Engineering students with a demonstrated ability and interest in soil, water, and land improvement. The selection of a recipient is by the Scholarship Committee in consultation with the Agricultural Engineering Department. No application is required.

### ***Atlantic Provinces Hatchery Federation Scholarship***

The Atlantic Provinces Hatchery Federation offers a scholarship of \$300 to a resident of the Atlantic Provinces who is admitted to the third or fourth year of the B.Sc. (Agr.) program and is enrolled in subjects that make poultry a major area of study. *Interested students should write a letter of application to Mr. George Smith, Supervisor of Poultry, Nova Scotia Dept. of Agriculture and Marketing, Box 550, Truro, Nova Scotia B2N 5E3, no later than September 17.*

### ***A.W. Mackenzie Memorial Scholarship***

A scholarship of \$150 is offered to a student entering the second year of the degree program. The scholarship is awarded on the basis of scholastic standing, need, and participation in 4-H Club activities. *A letter of application indicating 4-H experience must be received at the Registrar's Office, NSAC, not later than September 17.*



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## Scholarships and Bursaries

### ***Beaver Foods Limited Bursaries***

Beaver Foods Limited offers two bursaries of \$500 each to outstanding students with high academic standing who, for one reason or another, have not qualified for other significant awards. Students in either degree or technical programs are eligible. No application is required.

### ***Blueberry Producers Association of Nova Scotia Scholarship***

The Blueberry Producers Association of Nova Scotia is providing a \$500 award to a Plant Science student entering their graduating year of the B.Sc. (Agr.) program. Preference will be given to someone with a specialization in small fruits. The award will also be based on scholarship and need. An application may be obtained at the Registrar's Office. *The closing date for the receipt of application is September 17.*

### ***Bravo 500 Plant Protection Scholarship***

Fermenta Plant Protection Company offers two scholarships of \$1,250 each to students entering the third or fourth year of the Plant Protection option at the NSAC. One scholarship will be awarded to a qualified resident of Prince Edward Island, the other scholarship to a qualified resident of New Brunswick. The selection of the recipients will be based on academic standing, interest in the Maritime potato industry, and potato farm experience or background. If no suitable candidates apply, the scholarships will not be awarded for that academic year. *A letter of application must be received by the Registrar's Office, NSAC before September 17.*

### ***Bruce Trenholm/Atlantic '88 Scholarship***

Up to \$500 will be awarded annually to a student who is a resident of Atlantic Canada and entering the final year of any program. The recipient must be from a Holstein farm or have been a 4-H member with a Holstein calf project. Academic standing and career goals will also be considered. All candidates will be subject to an interview, and the selection will be made by a committee consisting of a member of the Trenholm family, a member of the Atlantic Extension Committee of Holstein Canada, and a representative of the College. *A written application must be submitted to the Registrar's office no later than September 17.*

### ***Canada Packers Scholarship***

Canada Packers Inc. offers an annual scholarship valued at \$1,000 to a student who completes the third year in the Animal Science option of the B.Sc. (Agr.) program and has registered for the final year. The student may also be offered an internship with the company for the summer period between the third and fourth academic years. Candidates are considered on the basis of academic standing, leadership qualities, and participation in student and community affairs. Selection of the recipient is made following the fifth semester (first term of the third academic year) of the student's program by company representatives and on the recommendation of the NSAC Scholarship Committee. The presentation of the scholarship takes place at Autumn Assembly in the final year of the student's program. Application forms are available at the Registrar's Office, NSAC. *The deadline for applications to be at the Registrar's Office is February 1.*



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## Scholarships and Bursaries

### ***Canadian Feed Industry Association (Atlantic Division) Scholarship***

The Atlantic Division of the Canadian Feed Industry Association offers a \$500 scholarship to a student who has successfully completed the second year of the B.Sc. (Agr.) program and who has enrolled in the third year. Academic standing and leadership in student and community affairs are important considerations in selecting the recipient. Application forms are available at the Registrar's Office. *The deadline for applications to be received at the Registrar's Office is September 17.*

### ***Chicken Producers Association of Nova Scotia Scholarship***

This one-time scholarship of \$1,000 is for a Nova Scotia student in any year of any program who shows a demonstrated interest in pursuing the study of poultry. A farming background is preferred. *A letter of application is to be received by the Secretary, Chicken Producers Association of Nova Scotia, Kentville Agricultural Centre, Kentville, Nova Scotia, B4N 1J5, by September 17.*

### ***Cobequid Dog Club Scholarship***

The Cobequid Dog Club offers a scholarship of \$400 to a student of the Nova Scotia Agricultural College who is admitted to a veterinary college. Preference in the awarding of this scholarship is given to a resident of Nova Scotia. Selection of the recipient is made by the Scholarship Committee, NSAC. No application is necessary.

### ***Colonel Charles Coll Memorial Scholarship***

A scholarship with a value of approximately \$500 is offered by Mr. Harry Coll and heirs, in memory of Colonel Charles H. Coll, to a student from the Maritime Provinces in the final year of an Animal Science option (or program) in a degree or technical program. Candidates are considered on the basis of academic standing, involvement and interest in poultry, and achievement and contribution to 4-H. No application is necessary. The selection of the recipient is made on the recommendation of the Animal Science Department, and the scholarship is awarded at the Autumn Assembly.

### ***Co-op Atlantic Scholarship***

Co-op Atlantic offers a scholarship of \$1,000 to a student at the Nova Scotia Agricultural College who is from the Atlantic Provinces and is entering the third year of the B.Sc. (Agr.) program at NSAC. The scholarship is awarded on the basis of scholastic ability, financial need, and knowledge and appreciation of co-operatives. The award may be tenable for two years. Application forms may be obtained from the Registrar's Office, NSAC. *Applications must be submitted to the Registrar by August 31.*

### ***David W. Brown Bursary***

The A.C.A. Co-operative Association Limited offers two bursaries of \$500 each to worthy students entering the second year of the degree program or the second year of the technician program. The bursaries are awarded on the basis of scholastic achievement, need, and interest in farming and in the poultry industry in particular. *Applications for the bursaries must be made by August 1.* Application forms are available from the Registrar's Office.

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## Scholarships and Bursaries

### ***Donald E. Clark Memorial Scholarship***

In memory of the late Professor and Head of the Agricultural Engineering Department, Donald E. Clark, one or more scholarships are offered to final-year students in the Agricultural Engineering Department, awarded on the recommendation of the Agricultural Engineering Department staff. The value of the scholarship(s) is determined by the number offered and the interest accrued from a fund established by friends and associates of the late Donald E. Clark in the fields of teaching and industry. The awarding of the scholarship(s) is based on academic standing, interest, and aptitude in the engineering field. No application is necessary.

### ***Dorothy Creelman Cox Scholarship***

A scholarship with a value of approximately \$200 is offered annually to a female student who successfully completes the first year of the B.Sc. (Agr.) program and enters the Plant Science option. Scholastic standing and contribution to the college community are the important criteria in the selection of the recipient. The selection of the recipient will be made by the NSAC Scholarship Committee on the recommendation of the Plant Science Department. No application is required.

### ***Edith Main Memorial Bursary***

A bursary in memory of Edith Main is provided through a fund established by the former auxiliary to the Nova Scotia Veterinary Medical Association. The value of the bursary is accrued interest. The recipient must be a student from Nova Scotia who has attended the NSAC and has been admitted to a Canadian veterinary college. The selection is made by the Scholarship Committee, NSAC, and no application is required.

### ***Ernest L. Eaton Memorial Scholarships***

Two scholarships of \$500 each, one for a male and one for a female, are offered to students with the highest averages in the work of the second year B.Sc.(Agr.) program. Candidates must be enrolled in the third year of the program. The scholarships are presented at Autumn Assembly. No application is required.

### ***Farm Credit Corporation Bursary***

The Atlantic Region of the Farm Credit Corporation offers a \$1,000 scholarship to a Canadian student (citizen or permanent resident) entering the fourth or final year of the B.Sc. (Agr.) program in the Agricultural Economics option. The selection criteria in order of priority are: (1) an average of 75% or over (70% or over if fewer than two students have averages of 75% or over) in the work of the student's third year (not less than eight subjects); (2) interest and competence in farm management and in the subjects associated with the economics of the farm business; (3) interest and involvement in college and home community as demonstrated by participation in organizations and affairs; (4) farm experience; and (5) financial need where significant differences between candidates can be identified. No application is required. The selection of the recipient will be made by the NSAC Scholarship Committee, on the recommendation of the Agricultural Economics Department. The bursary will be presented at Autumn Assembly.

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## Scholarships and Bursaries

### ***Farm Focus Bursary***

The Farm Focus newspaper offers a bursary of \$200 to a worthy student entering the second year of the degree or technician programs. Academic standing and financial need are taken into consideration in awarding this bursary. No application is necessary.

### ***G. E. O'Brien Memorial Award***

A minimum of \$500 is presented to a degree student who has demonstrated a particular interest in and aptitude for sheep and wool production and marketing. This award is in memory of George Earle O'Brien, born in Yarmouth County, who graduated from NSAC in 1911. He became an international wool merchant and, together with sheep producers from every province, organized and managed Canada's first national farmers' co-operative. This award is made on the recommendation of the Animal Science Department. No application is required. Subject to the approval of the Department of Animal Science, the award may on occasion take a different form, such as financing attendance at a major sheep industry-related event within or outside Canada.

### ***Hillbreeze Acres Scholarship***

A scholarship valued at \$500 is presented by Mr. Dan Hill to a student who has completed at least one year of the B.Sc. (Agr.) program with a good academic record and has participated in athletics at the college. A written application is required. *Applications must be submitted to the Registrar's office no later than September 17.*

### ***Ira L. Rhodenizer Memorial Scholarship***

The Nova Scotia Federation of Agriculture offers a scholarship of \$300 to a student in the second-year technician class or the second-year degree class as a memorial to the late Ira L. Rhodenizer, long-time friend of organized agriculture and the 4-H movement. The recipient must be a Nova Scotian of high academic standing who has taken an active part in student affairs and has been active in the 4-H movement. The scholarship is payable after the winner has registered for a second year. *A letter of application indicating 4-H experience must be received at the Registrar's Office, NSAC, not later than September 17.*

### ***Dr. Kenneth Cox Scholarship***

As a tribute to their retiring Principal, the Class of 1964 of the Nova Scotia Agricultural College established a fund of \$2,000. The interest on this fund is awarded annually to a worthy student entering the final year of the B.Sc. (Agr.) program. No application is necessary.

### ***Kings County Federation of Agriculture Bursary***

A \$500 bursary is offered to a resident of Kings County, N.S., enrolled in a full-time program of study at the NSAC. The award will be based on financial need, academic achievement, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the executive or a committee of the K.C.F.A. *Applications should be received by the Kings County Federation of Agriculture, P.O. Box 185, Port Williams, N.S. B0P 1T0 before June 30.*



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## Scholarships and Bursaries

### ***Masterfeeds Scholarship***

Masterfeeds, a division of Robin Hood Multifoods Inc., offers a \$1,000 scholarship to a Newfoundland student entering the second year of a business and economics program. The scholarship is to encourage students to consider a career in sales and technical service in private industry. Where there is not a suitable business candidate an Animal Science major may be considered. No application is required. The scholarship will be presented at Autumn Assembly.

### ***New Brunswick Poultry Council Scholarship***

The New Brunswick Poultry Council offers an annual scholarship of \$500 to a student of the Pre-Veterinary program at NSAC who is admitted to the Atlantic Veterinary College or other similar Canadian veterinary college. The selection of the recipient of this award will be made by the Veterinary Selection Committee and approved by the New Brunswick Poultry Council. In the event that more than one student possess otherwise equal qualifications for an annual award, preference will be given to a student from New Brunswick. No application is necessary.

### ***Newfoundland Egg Marketing Board Scholarship***

The Newfoundland Egg Marketing Board offers a scholarship of \$1,000 to a Newfoundland student entering the third or fourth year of the B.Sc. (Agr.) program. *Applications may be obtained from the Registrar's Office and must be submitted by September 17.*

### ***Nova Scotia Federation of Agriculture Scholarships***

The Nova Scotia Federation of Agriculture offers two scholarships of \$300 each to residents of Nova Scotia. One is awarded to a student who has completed the work of the first year of the degree program and is entering the second year; the other is awarded to a student who has completed the work of the first year of the technician program and is entering the second year of that program. Financial need and academic standing are considered in making the award. No application is necessary.

### ***Nova Scotia Milk Producers Scholarship***

The Nova Scotia Milk Producers Association offers a scholarship of \$1,000 to a Nova Scotia student who enters the third year of the B.Sc. (Agr.) program. The recipient will be selected by the Scholarship Committee, NSAC, and the presentation will be made at Autumn Assembly. No application is required.

### ***Rhonda Rae Rumbolt Memorial Scholarship***

The Rhonda Rae Rumbolt Memorial Scholarship awards a \$2,000 scholarship to a degree student who has successfully completed the third year of studies and enters the fourth year at NSAC. The Scholarship Committee will select the student on the basis of high academic standing and involvement in the college community as displayed by participation in extracurricular activities. *A letter of application detailing involvement in student life must be received by the Registrar's office no later than September 17.* The scholarship will be presented at Autumn Assembly.



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## Scholarships and Bursaries

### ***University of Maine Scholarship***

Under the agreement between the University of Maine at Orono and the Nova Scotia Agricultural College, up to five students each year who have completed the second year of the B.Sc. (Agr.) Program and who are residents of the Maritime Provinces and are recommended by the Vice-Principal may enter the penultimate year at Maine and pay the same tuition as the residents of Maine. The tuition is a varying figure, but the arrangement represents a saving of about \$1,000 per year.

### ***Vice-Principal's Scholarship***

A scholarship is offered each year to a worthy student who has completed three years of the degree program and is enrolled in the fourth year. The selection is to be made by the Vice-Principal of NSAC.

No application is required.

### ***The Wilfred Cyr Memorial Scholarship***

The New Brunswick Sheep Breeders Association, in memory of the late Wilfred Cyr, offers two scholarships of \$100 each to students from New Brunswick (one anglophone and one francophone) who have completed the first year of a degree or technical program at the Nova Scotia Agricultural College and who enter the second year of the program. Application forms can be obtained from the office of the New Brunswick Sheep Breeders Association or from the Registrar's Office, NSAC. *The deadline for applications to be received at the Registrar's Office is September 17.*

### ***Women's Institutes Scholarship***

The Women's Institutes of Nova Scotia offer a \$500 scholarship to a student who enters the third year of the program leading to a B.Sc. (Agr.) degree. Selection of the recipient is made by the Scholarship Committee of the W.I.N.S. on recommendation of the NSAC Scholarship Committee. First priority is given to academic standing. Consideration is also given to leadership and participation in student and community affairs, and to financial need. The scholarship is presented at Autumn Assembly. Applications are available at the W.I.N.S. or at the Registrar's Office, NSAC. The application must be accompanied by an up-to-date transcript of marks and a letter outlining the applicant's career plans. *Applications with enclosures must be received at the office of the W.I.N.S., Cumming Hall, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia B2N 5E3, by May 15.*

### ***Technical Scholarships***

#### ***Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Technical Programs***

The Nova Scotia Department of Agriculture and Marketing offers scholarships of \$500 to all NSAC students who are residents of Nova Scotia and who are admitted for their second or third year of the technical programs with averages in the work of the previous year at NSAC of 80% or higher and with no failed subjects. No application is necessary.

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## Scholarships and Bursaries

### ***Atlantic Farm Mechanization Show Scholarship***

The Atlantic Farm Mechanization Show offers one or more scholarships of approximately \$1,000 total value to students from the Atlantic Provinces who have completed at least one year of studies at the College, and who are currently enrolled in a degree or technical program of Engineering, Mechanization, or Farm Equipment. The awarding of the scholarship(s) is based on academic achievement and demonstrated potential for a career in the area of mechanization of agriculture. The award is made on the recommendation of the Agricultural Engineering Department. No application is necessary.

### ***Atlantic Fertilizer Institute Scholarship (Technical)***

The Atlantic Fertilizer Institute offers an annual scholarship, valued at \$500, to a student in the technician or farming technology program who has satisfactorily passed the first academic year and has entered the second year of studies. Only students who intend to farm will be considered. The selection of the recipient by the Scholarships Committee of NSAC will be based upon leadership qualities within the college community, combined with a desirable scholastic standing. The presentation of this scholarship takes place at the Autumn Assembly. Application forms are available from the Registrar's Office, NSAC. *The deadline for receiving applications is September 17.*

### ***Atlantic Land Improvement Contractors Association Scholarship***

An annual scholarship of \$500 has been established by the Atlantic Land Improvement Contractors Association. The scholarship is available to degree Agricultural Engineering students with a demonstrated ability and interest in soil, water, and land improvement. The selection of a recipient is by the Scholarship Committee in consultation with the Agricultural Engineering Department. No application is required.

### ***Atlantic Provinces Hatchery Federation Scholarship (Technical)***

The Atlantic Provinces Hatchery Federation offers a scholarship of \$200 to a resident of the Atlantic Provinces who is admitted to the final year of a technical program and who has a specific interest in poultry. *A letter of application must be submitted to Mr. George Smith, Supervisor of Poultry, Nova Scotia Dept. of Agriculture and Marketing, Box 550, Truro, Nova Scotia B2N 5E3, no later than September 17.*

### ***Beaver Foods Limited Bursaries***

Beaver Foods Limited offers two bursaries of \$500 each to outstanding students with high academic standing who, for one reason or another, have not qualified for other significant awards. Students in either degree or technical programs are eligible. No application is required.

### ***Bravo 500 Technology Bursary***

Fermenta Plant Protection Company offers a bursary of \$500 to a student entering the second year of a technology program at NSAC. The selection of the recipient will be based on academics, need, and an interest in the agricultural industry. *A letter of application must be received by the Registrar's Office, NSAC before September 17.*

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## Scholarships and Bursaries

### ***Bruce Trenholm/Atlantic '88 Scholarship***

Up to \$500 will be awarded annually to a student who is a resident of Atlantic Canada and entering the final year of any program. The recipient must be from a Holstein farm or have been a 4-H member with a Holstein calf project. Academic standing and career goals will also be considered. All candidates will be subject to an interview, and the selection will be made by a committee consisting of a member of the Trenholm family, a member of the Atlantic Extension Committee of Holstein Canada, and a representative of the College. *A written application must be submitted to the Registrar's office no later than September 17.*

### ***Canadian Society for Horticultural Science Scholarship***

A scholarship of \$250 is granted annually to two students enrolled in a Canadian diploma program that specializes in Horticulture. Eligible institutions include members of the Canadian Association of Diploma in Agriculture Programs (CADAP) and other institutions which, in the opinion of the selection committee, provide the student with the equivalent of a two-year post-secondary Horticulture Diploma.

The scholarship will be made on the basis of academic performance and class standing in the first year of the program and documentation of other relevant information including experience in horticulture. *Deadline for complete applications is June 30.* The scholarship will be presented at an appropriate college award or graduation ceremony.

### ***Chicken Producers Association of Nova Scotia Scholarship***

This one-time scholarship of \$1,000 is for a Nova Scotia student in any year of any program who shows a demonstrated interest in pursuing the study of poultry. A farming background is preferred. *A letter of application is to be received by the Secretary, Chicken Producers Association of Nova Scotia, Kentville Agricultural Centre, Kentville, Nova Scotia, B4N 1J5, by September 17.*

### ***Colonel Charles Coll Memorial Scholarship***

A scholarship with a value of approximately \$500 is offered by Mr. Harry Coll and heirs, in memory of Colonel Charles H. Coll, to a student from the Maritime Provinces in the final year of an Animal Science option (or program) in a degree or technical program. Candidates are considered on the basis of academic standing, involvement and interest in poultry, and achievement and contribution to 4-H. No application is necessary. The selection of the recipient is made on the recommendation of the Animal Science Department, and the scholarship is awarded at the Autumn Assembly.

### ***David W. Brown Bursary***

The A.C.A. Co-operative Association Limited offers two bursaries of \$500 each to worthy students entering the second year of the degree program or the second year of the technician program. The bursaries are awarded on the basis of scholastic achievement, need, and interest in farming and in the poultry industry in particular. *Applications for the bursaries must be made by August 1.* Application forms are available from the Registrar's Office.



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## Scholarships and Bursaries

### ***Donald E. Clark Memorial Scholarship***

In memory of the late Professor and Head of the Agricultural Engineering Department, Donald E. Clark, one or more scholarships are offered to final-year students in the Agricultural Engineering Department, awarded on the recommendation of the Agricultural Engineering Department staff. The value of the scholarship(s) is determined by the number offered and the interest accrued from a fund established by friends and associates of the late Donald E. Clark in the fields of teaching and industry. The awarding of the scholarship(s) is based on academic standing, interest, and aptitude in the engineering field. No application is necessary.

### ***Eastern Animal Health Technicians Association Bursary***

The Eastern Animal Health Technician Association offers a \$100 bursary to a student who has successfully completed two years of the Animal Health Technology program and is enrolled in the third year. This bursary will be awarded to the student who best demonstrates proficiency in veterinary clinical skills during their second year and externship at the Atlantic Veterinary College. Selection will be made by supervising technicians at NSAC and AVC. No application is necessary.

### ***Farm Focus Bursary***

The Farm Focus newspaper offers a bursary of \$200 to a worthy student entering the second year of the degree or technician programs. Academic standing and financial need are taken into consideration in awarding this bursary. No application is necessary.

### ***H.A.L. MacLaughlin Memorial Scholarship***

The income derived from a trust fund established by the MacLaughlin family will be awarded annually as a scholarship to a student in horticulture. An academic standing of at least 70% is the minimum requirement. The recipient is chosen annually by the Principal of the NSAC. No application is necessary.

### ***Ira L. Rhodenizer Memorial Scholarship***

The Nova Scotia Federation of Agriculture offers a scholarship of \$300 to a student in the second-year technician class or the second-year degree class as a memorial to the late Ira L. Rhodenizer, long-time friend of organized agriculture and the 4-H movement. The recipient must be a Nova Scotian of high academic standing who has taken an active part in student affairs and has been active in the 4-H movement. The scholarship is payable after the winner has registered for a second year. *A letter of application indicating 4-H experience must be received at the Registrar's Office, NSAC, not later than September 17.*

### ***Kings County Federation of Agriculture Bursary***

A \$500 bursary is offered to a resident of Kings County, N.S., enrolled in a full-time program of study at the NSAC. The award will be based on financial need, academic achievement, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the executive or a committee of the K.C.F.A. *Applications should be received by the Kings County Federation of Agriculture, P.O. Box 185, Port Williams, N.S. B0P 1T0 before June 30.*



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## Scholarships and Bursaries

### ***Nova Scotia Federation of Agriculture Scholarships***

The Nova Scotia Federation of Agriculture offers two scholarships of \$300 each to residents of Nova Scotia. One is awarded to a student who has completed the work of the first year of the degree program and is entering the second year; the other is awarded to a student who has completed the work of the first year of the technician program and is entering the second year of that program. Financial need and academic standing are considered in making the award. No application is necessary.

### ***Nova Scotia Veterinary Medical Association Bursaries***

The Nova Scotia Veterinary Medical Association provides bursaries of \$500 each to two students, based on financial need, who have successfully completed the second year of the Animal Health Technology program and who are continuing into the third year of the program. No application is necessary.

### ***Raymond Webber Memorial Award***

This award of \$300 is presented annually by the Atlantic Provinces Nursery Trades Association to the most promising Landscape Horticulture Technology student who has completed the first year of the program. The recipient will be selected for achievement in both academic and practical work. The recipient will be recommended by the Plant Science Department, and the award will be presented at Autumn Assembly. No application is required.

### ***Dr. Robert C. Rix Family Farm Bursary***

This bursary of \$300 is offered annually to a student who enters the final year of the Farming Technology program. It is awarded on the recommendation of the Economics and Business Department staff. The selection is based on the student's determination and dedication to the objective of operating a family farm, the extent to which the student is hard-working and conscientious, and financial need. The bursary is presented at the Autumn Assembly. No application is required.

### ***The Wilfred Cyr Memorial Scholarship***

The New Brunswick Sheep Breeders Association, in memory of the late Wilfred Cyr, offers two scholarships of \$100 each to students from New Brunswick (one anglophone and one francophone) who have completed the first year of a degree or technical program at the Nova Scotia Agricultural College and who enter the second year of the program. Application forms can be obtained from the office of the New Brunswick Sheep Breeders Association or from the Registrar's Office, NSAC. *The deadline for applications to be received at the Registrar's Office is September 17.*

## Scholarships for B.Sc.(Agr.) Graduates

### ***Arlen Kerr Memorial Scholarship Fund***

The objective of the Foundation is to provide a scholarship called the Arlen Kerr Memorial Scholarship Fund to provide funding for deserving students attending any veterinary college or university in Canada for the purpose of study in mink research. The scholarship has a value of approximately \$1,200 and may be renewable with reapplication. The Research Committee will make the selection. No application is required.

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## Scholarships and Bursaries

### ***Harney Estate Scholarships***

The late Dr. Patricia Harney, Class of '48, Diploma, has bequeathed a sizeable portion of her estate to NSAC. The income from the funds is to be used to provide three scholarships for NSAC graduates to pursue graduate study at Macdonald College, McGill University, or the University of Guelph. The funds make further study possible for NSAC graduates and help preserve the long-standing links between NSAC, Macdonald College, and Guelph. Please make application at the Registrar's Office, NSAC.

### ***Nova Scotia Fur Institute Scholarship***

Candidates must be graduates in Animal Science from the Nova Scotia Agricultural College and be accepted to a graduate program in fur production at an approved university. Scholastic achievement will be a primary factor in candidate selection. This scholarship (\$2,500) will be awarded to no more than one individual yearly. Applications should be forwarded to the Chairman, Nova Scotia Fur Institute, Box 550, Nova Scotia Agricultural College, Truro, Nova Scotia B2N 5E3. *Deadline for receiving applications is May 31.*

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# Medals, Awards and Prizes

## ***Atlantic Provinces Swine Producers' Award***

The Newfoundland Swine Producers Association, the New Brunswick Pork Producers Association, the Pork Producers Association of Nova Scotia, and Prince Edward Island Quality Swine Incorporated jointly sponsor two awards annually.

\$400 is awarded to a student in the technology or technician program in the graduating class who, through performance in the Swine Production course and in light of other swine-related endeavours, shows the best combination of academic performance and practical swine husbandry ability. The prize is awarded on the recommendation of the Animal Science Department of the College.

\$600 is awarded to a student in the graduating class of the B.Sc. (Agr.) program in recognition of academic excellence, combined with a genuine interest in the swine industry in Atlantic Canada. Performance in the degree-level swine production course and in other course work associated with swine production is the major consideration in selecting the recipient.

## ***Dr. Gerry W. Friars Undergraduate Research Award***

Dr. Friars, an NSAC Alumnus, was introduced to scientific research by an undergraduate research project. This was the beginning of a career in research and teaching. In recognition of the significance of this first research experience, Dr. Friars has provided a sum of money to endow an Undergraduate Research Award. This award is presented to the student who is judged to have completed the best research project as a part of the Ag-Challenge Competition in the winter semester of the fourth year. Selection of the winner is made by a committee appointed by the Principal.

## ***Governor-General's Medals***

A silver Governor-General's Medal is awarded annually to the student in the degree programs who achieves the highest academic standing in the graduating class. A bronze Governor-General's Medal is awarded annually to the student in the technical programs who achieves the highest academic standing in the graduating class.

## ***G.G. Smeltzer Award***

This award is presented to a student who is registered in a second year of study at NSAC and excels in the work of the first-year Plant Science technician program.

## ***H.J. Fraser Memorial Prize for English***

In memory of the late Professor H.J. Fraser, a prize is awarded each autumn, on the recommendation of the English Department, to a second-year student who has achieved excellence in a first-year English course at this institution.

## ***K. de Geus Memorial Prize for Plant Science***

In memory of the late K. de Geus, a prize is awarded annually at graduation, on the recommendation of the Plant Science Department, to a student who has completed a technical course at NSAC. The award is based on high standing in course work and preference is given to students in the horticultural field. No application is necessary.

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## Medals, Awards and Prizes

### ***Ketchum Manufacturing Company Limited Prize***

The Ketchum Manufacturing Company Limited has provided \$2,000 in Dominion of Canada Bonds, the interest on which is used for an annual prize available to a College graduate registered in the Animal Science option. The prize is awarded to a worthy student with a satisfactory academic standing. The selection of the recipient is made by the Scholarship Committee of NSAC. No application is required.

### ***Nova Scotia Veterinary Medical Association Prize***

The Nova Scotia Veterinary Medical Association provides a prize of \$300 to a deserving student who excels in the animal physiology and animal health courses offered to technical students (Animal Science) and who subsequently enrolls in suitable courses of the technology year.

### ***R.H. Stevenson Memorial Prize for Mathematics and Physics***

In memory of the late Professor R.H. Stevenson, a prize is awarded each autumn, on the recommendation of the Mathematics and Physics Department, to a second-year student who has achieved excellence in the first year of Mathematics and Physics at this institution.









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