CALENDAR
1990-1991

Nova Scotia
Agricultural
College

Serving Atlantic Canada

CALENDAR
1990-1991

Eighty-fifth Annual Calendar

Nova Scotia Agricultural College

Under the Nova Scotia Department
of Agriculture and Marketing

Mailing Address
Office of the Registrar
Nova Scotia Agricultural College
PO Box 550
Truro, Nova Scotia
B2N 5E3

Telephone 895-1571, Ext. 131

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Contents

Application for Admission

Nova Scotia Agricultural College

P.O. Box 550
Truro, Nova Scotia
B2N 5E3

For Office Use Only				
Student Number				
Year of Study	*1*	*2*	*3*	*4*
Credits	*(0-8)*	*(9-17)*	*(18-28)*	*(29+)*
		FT	*PT*	*SP*

Date _____

When Completing Application Form Please Print.

Applications will not be considered until a transcript of high school marks has been submitted. Applicants who have attended a post-secondary institution are also required to submit a transcript(s) of their record from there.

1. Canadian Social Insurance Number_____

2. Name Mr. ( ) Mrs. ( ) Ms. ( ) Miss ( ) (Surname)_____

   (First Name)_____(Second Name)_____

3. Home Address No. and Street_____Town, City, Etc._____

   County_____Province_____Postal Code_____Telephone_____

4. Date of Birth_____Sex (M/F) ( ) Marital Status ( ) Maiden Name (If applicable)_____

5. Immigration Status for Non-Canadian: Landed Immigrant ( ) Student Visa ( ) Other Visa_____

   Status Unknown ( ) Date of Entry into Canada_____Mother Tongue (If not English)_____

6. Citizenship_____

7. Parent, Guardian (or next of kin if married or over 21) Name_____

8. Educational Institution Attended on December 1 Last Year_____

9. Have you previously been registered at NSAC? Yes_____No_____If yes, please indicate year and surname under which you were registered_____

10.	EDUCATION			EMPLOYMENT		
Academic Year	High School or College Attended	Location	Grade or Year	Date	Name of Company	Duties

Program Desired *(Indicate by check mark [☑])*

Degree [B.Sc.(Agr.)]	☐	Technician		Technology	
Pre-Veterinary	☐	Agricultural Business	☐	Agricultural	☐
Agricultural Engineering [B.Sc.(Agr.Eng.)]	☐	Agricultural Engineering	☐	Agricultural Engineering	☐
Engineering [B.Sc.(Eng.)]	☐	Animal Science	☐	Animal Health	☐
Special (to take degree courses)	☐	Farm Equipment	☐	Biology	☐
		Plant Science	☐	Chemistry Laboratory	☐
		Pre-Tech Semester (January)	☐	Farming	☐
		Special (to take Technical courses)	☐	Food Laboratory	☐
				Landscape Horticulture	☐

In submitting this application form, I hereby agree to abide by the rules and regulations of the College.

Signature of Applicant _____

Signature of Parent or Guardian _____

(Required only if applicant is under 19)

1990-1991 Calendar

1990

July 1990

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August 1990

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September 1990

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October 1990

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 1990

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December 1990

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

1991

January 1991

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February 1991

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March 1991

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April 1991

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May 1991

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 1991

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Academic Calendar 1990-1991

1990

September 4	Registration for first-time students.
September 5	Registration for returning students.
September 6	Fall Semester classes begin.
October 8	Thanksgiving. No classes.
November 2	College Royal Program. No classes.
November 12	Observance of Remembrance Day. No classes.
December 7	Last day of classes, Fall Semester.
December 10-20	Fall Semester examinations.

1991

January 4 Jan. 7	Winter Semester registration ~~and classes begin.~~ classes begin
February 18-22	Mid-semester break for individual study.
March 29	Good Friday. No classes.
April 12	Last day of classes, Winter Semester.
April 15-25	Winter Semester examinations.

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. (TUNS), MBA(Dalhousie)

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

Dean of Students — Chaplain
Rev. D.I. MacEachern, B.A. (Mt. Allison), M.Div. (Pine Hill)

Director of Athletics
K.S. Marchant, B.P.Ed. (U.N.B.), 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)

Information Officer
R.F. Sparkes, B.Sc. (Memorial), B.Ed. (Memorial)

Faculty

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

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

James Adams, B.Sc. (Strathclyde), M.Sc. (Reading)
Associate Professor

J.F. Adsett, B.Sc. (Agr.) (McGill), M.Sc.E. (U.N.B.)
Assistant Professor

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

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

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

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

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

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

L.M. Cock, B.Sc. (Agr.)(McGill), M.S. (Wisconsin), Ph.D. (Maine)
Professor

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

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

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

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

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

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

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

Faculty

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

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

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

A.E. Roland, B.A. (Acadia), M.A. (Toronto), Ph.D. (Wisconsin), D.Sc. (Acadia), LL.D. (Dalhousie),F.A.I.C.
Professor Emeritus

M.E. Neary, B.Sc. (Agr.)(McGill)
Professor Emeritus

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

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

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

L.A. McFadden, B.Sc. (Agr.)(McGill), M.Sc. (Cornell), Ph.D. (Cornell)
Professor

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

Chemistry-Soils
H.M. MacConnell, B.Sc. (Agr.)(McGill), M.Sc. (McGill)
Associate 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

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)
Assistant Professor

Faculty

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

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

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

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

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.M. Bowker, B.A. (Bates), Ph.D (Texas A & M)
Assistant 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

P. Lederman, B.A. (Queens), M.A. (Dalhousie), LL.B. (Queens), BCL(Oxford)
Sessional Lecturer

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

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

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

P.A. MacCormick, B.A. (Dalhousie), B.Ed. (Dalhousie), M.B.A. (Dalhousie)
Sessional Lecturer

Rev. D.I. MacEachern, B.A. (Mt. Allison), M.Div. (Pine Hill)
Associate Professor, Dean of Students, and Chaplain

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

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

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

Mathematics and Physics
S.G. Smith, B.Sc. (Mt. Allison), 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)
Assistant Professor

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

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

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

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

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

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

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

J.S. Bubar, B.Sc. (Agr.)(McGill), M.S. (Pennsylvania State), Ph.D. (McGill)
Professor

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

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

T.H. Haliburton, B.Sc. (Agr.)(McGill), M.S. (Cornell)
Associate 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)
Associate Professor

Faculty

L.R. Mapplebeck, B.Sc. (Guelph), M.Sc. (Guelph)
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.G. Robertson, B.Sc. (For.)(Aberdeen)
Sessional Lecturer from the N.S. Dept. of Lands and Forests

Schedule of Payments

Deposits

In the letter that offers final acceptance the student is asked to forward to the Registrar's Office a $25 registration deposit and, for students who want a place in residence, a $75 room deposit. The receipt for $100 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 $25 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 deposit will be refunded when students cancel their applications before August 12. After this date, there is no refund of the $25 course deposit. The $75 residence deposit will be refunded up to, but not after, August 31 provided the Registrar's Office is notified.

Deposits are subtracted from the total payments due at registration in September (see page 12).

The student must have *final* acceptance before submitting a deposit. Deposits submitted by students who have not received final acceptance will be returned.

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. The rate in the summer months (May 1 to September 1) for students and others is $19 per day for double occupancy.

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 $498 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 of lectures missed, 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 do not receive their Certificate of Eligibility (Schedule 1 form) before registration, must pay the required fee at registration time. Students should therefore arrange the necessary temporary financing before their arrival for registration.

Schedule of Payments

Degree Programs

All charges are subject to change.

Tuition fees for foreign students who are non-sponsored are an additional $1,700 ($850 per semester).

Payment due Sept. 4 (returning students Sept. 5), 1990

Tuition	$	700
Accommodation and meals	$	1,625
Caution and laboratory deposit	$	55
Students' Union	$	60
Athletics	$	45
Medical fee and insurance	$	15
		2,500
Books (estimated)	$	300

Payment due January 3, 1991

Tuition	$	700
Accommodation and meals	$	1,735
		2,435
Books (estimated)	$	300

All students must pay a refundable key deposit. Every student registering for a chemistry course should purchase and use a laboratory coat.

Technician and Technology Programs

All charges are subject to change.

Tuition fees for foreign students who are non-sponsored are an additional $1,700 ($850 per semester).

Payment due Sept. 4 (returning students Sept. 5), 1990

Tuition	$	300
Accommodation and meals	$	1,625
Caution and laboratory deposit	$	55
Students' Union	$	60
Athletics	$	45
Medical fee and insurance	$	15
		2,100
Books (estimated)	$	300

Payment due January 3, 1991

Tuition	$	300
Accommodation and meals	$	1,735
		2,035
Books (estimated)	$	300

All students must pay a refundable key deposit.

Schedule of Payments

Individual Course Cost (Part-Time Students)

Degree	$	180
Technical	$	80
Degree Audit	$	40
Technical Audit	$	20

The Student Union has approved a fee of $15 for the Medical Services Fund, to be collected from all students at the time of registration. The fund provides nonprescription drugs and other supplies for the infirmary and student operations. All doctors' services will be requested by the College Health Service.

Except for health or other compelling compassionate reasons, students who withdraw after three weeks from the commencement of classes will receive no refund of the tuition and accommodation fees. The amount of the refund for students who withdraw within those three weeks will be 75% of the tuition and accommodation fees for a student who withdraws during the first week of classes, 50% for a student who withdraws during the second week, and 25% for a student who withdraws during the third week. The meals refund will be in accordance with the number of weeks remaining in the semester.

Students who leave residence after three weeks from the commencement of classes will receive no refund of the accommodation fee. The amount of refund for students who leave residence within those three weeks will be 75% of the accommodation fee for a student who leaves residence during the first week of classes, 50% for a student who leaves residence during the second week, and 25% for a student who leaves residence during the third week. The rate for room rent (double occupancy) is $50 per week. The meals refund will be in accordance with the number of weeks remaining in the semester.

Students who withdraw after the date on which the Dropped Failure status takes effect are not permitted to register in the following semester.

Students' Union and Medical Services 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. After a student has withdrawn, the Students' Medical Services Fund does not cover that person.

Residence Accommodations

Accommodation and meal facilities are available for male and female students. Students who have received final acceptance and want to reserve a place in residence are required to pay a deposit of $75. Returning students must pay this fee before June 30, and new students must pay it when they receive their letters of admission to the College. The deposit will be credited to the student's accommodations and meals account. It will be refunded to any applicant who finds it necessary to cancel the reservation, provided that notice of cancellation reaches the Registrar's Office not later than August 31. The use of laundry facilities is included in the accommodations and meals fee.

Schedule of Payments

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

- after dinner on September 5 for all new students,
- after dinner on September 6 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 $50 to the Registrar 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 and punished.

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.

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 person in charge. Over-the-counter medication is covered by a $7 medical fee, and $8 is charged to each student for insurance to provide 12-month accident coverage.

International students are required to have a sickness and accident coverage policy made available through the College.

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 Adv. Education & Job Training Box 2290, Station "M" Halifax, N.S. B3J 3C8
New Brunswick students	Department of Youth Centennial Building 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.

Class of '44 Lectureship

In 1984 the Class of '44 established a fund with the Alumni Association, the annual interest from which is to be used to assist with bringing to the campus special lecturers or outstanding presentations that will enrich the educational role of the College. Selection of, and arrangements for, these presentations will be made by the Principal and two members of the Faculty Council.

The Donald E. Curren Scholarship

Scholarships with a value of $1,000 are offered by the Canadian Paraplegic Association (Nova Scotia Division) to mobility-impaired students who are Canadian citizens and residents of the Atlantic Provinces. Preference will be given to paraplegics and quadraplegics. The selection of the applicants is on the basis of merit and on other criteria as determined by the Selection Committee.

Application forms are available from the Canadian Paraplegic Association, Nova Scotia Division, 5599 Fenwick Street, Halifax, Nova Scotia B3H 1R2. The deadline for applications to be received by the association is July 15.

Scholarships

Detailed information is given on pages 141-150.

General Information

Programs Offered

The Nova Scotia Agricultural College was formally opened in 1905 to assume and expand the work which 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 1980, NSAC received approval to offer all four years of the B.Sc. (Agr.) degree program. In addition, the first three years of an Agricultural Engineering degree, the first two years of an Engineering degree, a three-year Pre-Veterinary program, five technician programs, eight technology programs, and numerous vocational and continuing education courses will be offered.

Students in the B.Sc. (Agr.) program select one of seven options after the completion of the first year of the program: Plant Science, Animal Science, Agricultural Economics, Plant Protection, Agricultural Chemistry, Agricultural Soils, and Agricultural Mechanization. Most students entering the program 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 three-year Pre-Veterinary program to meet admission requirements of the Atlantic College of Veterinary Medicine at the University of Prince Edward Island must, after completing the first year, enter the Animal Science option and take a specific 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 this professional engineering degree. Students completing 22 specified courses of the engineering degree 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 Mechanization, 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 have also been organized in the areas of Farming, Landscape Horticulture, Agricultural Engineering, and Agricultural Technology, as well as in Animal Health, Biology, and Food and Chemistry Laboratory Technology.

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

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

The various courses arranged for the 1990-91 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 fulfill 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 84 years is conclusive evidence that students obtain a sound agricultural education in the programs offered.

The College buildings — Cumming Hall, Harlow Institute, Banting Building, Collins Horticultural Building, Cox Institute of Agricultural Technology with its recently opened extension, Boulden Building, Hancock Veterinary Building, the Library, an 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. The campus has a modern and complete Athletic Centre, as well as the Alumni Theatre.

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

Telephone
Nova Scotia Agricultural College, Truro (902) 895-1571

Banks and Credit Unions

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

Express and Freight
Express or freight may be forwarded to the Nova Scotia Agricultural College by either Canadian National Railway or Canadian Pacific Railways.

College Colors
Royal Blue and Regular Gold

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

Chaplaincy
Rev. Douglas MacEachern is Chaplain and Dean of Students. He works in close cooperation with the Executive of the Student Union and with the Chapel Committee. The Chaplaincy is concerned with the spiritual needs of the students and the development of a religious program, often in conjunction with churches in the community.

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 amount 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.

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

Student Activities

College Royal Winter Fair
Each college year, the students put on a College Winter Fair, or College Royal, as it is frequently called. The show is a competition in fitting and showmanship, rather than in the quality of the horses, cattle, sheep, swine, and poultry shown in the exhibition.

Besides livestock classes, the show also features competition in agronomy, horticulture, and farm management, and a series of educational demonstration booths.

The program and show are administered and operated by students.

Clubs and Committees

- A.C. Chorale
- Animal Science Club
- Chapel Committee
- Curling Club
- Equestrian Club
- 4-H Club
- Inter-Varsity Christian Fellowship
- Sustainable Agriculture Club

Social Activities
All social activities on the campus are supervised by a committee appointed by the United Students' Council. Informal dances and other social functions are held from time to time.

Athletics

The athletic program involves the following activities:

Recreational activities. The 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 College Conference which includes six other universities/colleges in Nova Scotia. Conference sports include soccer, volleyball, basketball, badminton, cross-country running, and hockey. Winners from the conference advance to the national championships administered by the Canadian Colleges Athletic Association. These championships take place in late March and move annually from province to province.

Also recognized as a varsity team are the woodsmen. Comprised of three teams (two for men, one for women), these teams compete on a tournament basis. They usually participate in five competitions during the year.

Rules and Regulations

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 Students.

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 honor 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 honors or prizes, or expulsion from the College.

Smoking is not allowed in classrooms or laboratories during regular class and laboratory hours or at any time in the dining areas, the Library (except in designated areas), the Athletic Centre, or the Alumni Theatre.

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 Students.

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

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

Residence Regulations

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

Rules and Regulations

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 Students.

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 that 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.

At registration all students are enrolled in a medical insurance plan and a campus medical fund.

Athletic Regulations

All students are eligible to play for teams representing the College, subject to conditions established by the NSAC, the Nova Scotia College Conference, 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 an official.

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.

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 one of seven options: Animal Science, Agricultural Economics, Plant Protection, Plant Science, Agricultural Chemistry, Agricultural Soils, and Agricultural Mechanization. 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 faculty of agriculture at another university.

Agricultural Engineering

NSAC offers the first three years of a professional program in Agricultural Engineering. Students may transfer to Macdonald College of McGill University or to any of the other six institutions offering agricultural engineering for their final years of this professional engineering degree.

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 or for transfer to any other institution offering engineering programs.

Pre-Veterinary Medicine

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

Technician Courses

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

Technology Courses

Eight programs are offered which 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 and Biology Technology are three-year programs. The Chemistry Laboratory Technology and Food Laboratory Technology programs and the Landscape Horticulture Technology program 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 for admission. For eleven 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.

Summary of Academic Programs

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.

Explanation of Terms and Codes

The courses listed in the syllabi and in the descriptions of courses beginning on page 64 are identified as to discipline and approximate academic level by letter and number codes. The disciplines are coded as follows:

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

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 three hundreds and four hundreds 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 which is usually offered in the first year, first semester of the technician program, while PS49 is a Plant Science course which is offered in the second year, second semester of the technician programs. B71 is a Biology subject offered in the first year, second semester of the Biology Laboratory Technician program.

The following definitions are important for the interpretation of the information provided in the section of the Calendar entitled "Description of Courses," which begins on page 65:

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

Explanation of Terms and Codes

Category Codes — B.Sc. (Agr.) Program

In the section "Description of Courses," most degree credit courses have a bracketed letter or pair of letters immediately following the name of the course. This bracketed letter or pair of letters indicates 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	**A**	Humanities	**H**
Agricultural Engineering	**AE**	Mathematics	**M**
Economics	**E**	Science	**S**
Engineering	**EN**		

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.

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:

End of first semester	50.0
End of second semester	52.5
End of third semester	55.0
End of fourth semester	57.5
End of fifth, sixth, seventh, and eighth semesters	60.0

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

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 course leading to a B.Sc. (Agr.) degree must present certificates showing an average of at least 60%, with no mark below 50%, in Grade XII (Nova Scotia 441, 70% in Math 442 acceptable, New Brunswick 121 or 122, Prince Edward Island university preparatory, or equivalent) English, Mathematics, Chemistry, Biology or Physics, plus one additional subject. 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.

All candidates for admission to the Agricultural Engineering program must present certificates showing an average of at least 60%, with no mark below 50%, in Grade XI (Nova Scotia 441, 70% in Math 442 acceptable, New Brunswick 121 or 122, Prince Edward Island university preparatory, or equivalent) English, Mathematics, Chemistry, Physics, and one other subject, preferably Biology.

All candidates for admission to the three-year Pre-Veterinary program must present certificates showing an average of at least 60%, with no mark below 50%, in Grade XI (Nova Scotia 441, 70% in Math 442 acceptable, New Brunswick 121 or 122, Prince Edward Island university preparatory, or equivalent) English, Mathematics, Chemistry, Physics, and one other subject, preferably Biology.

Degree Programs

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

Years 2, 3 and 4 – Agricultural Chemistry

Semester III

CS200	Biochemistry I
CS210	Chemical Principles II or CS215 Organic Chemistry II [1]
CS220	Introduction to Soil Science
MP110	Physics
	Elective[2]

Semester IV

CS205	Biochemistry II
CS225	Quantitative Analytical Chemistry
MP200	Statistics
MP221	Computer Science
	Elective[2]

Semester V

AS300	Animal Physiology
CS210	Chemical Principles II or CS215 Organic Chemistry II[1]
CS300	Physical Chemistry I or CS410 Industrial Processing of Agricultural Products[1]
CS305	Instrumental Analytical Chemistry I
	Elective[2]

Semester VI

B260	Plant Physiology
CS310	Radiotracers in Agriculture or CS400 Physical Chemistry II[1]
CS315	Instrumental Analytical Chemistry II
CS350	Food Chemistry or one of CS320 Soil Fertility, CS340 Soil Chemistry[1]
MP235	Differential Equations and Linear Algebra

Semester VII

AS305	Animal Nutrition
CS300	Physical Chemistry I or CS410 Industrial Processing of Agricultural Products[1]
CS449	Project-Seminar I
	Elective[2]
	Elective[2]

Semester VIII

CS310	Radiotracers in Agriculture or CS400 Physical Chemistry II[1]
CS350	Food Chemistry or one of CS320 Soil Fertility, CS340 Soil Chemistry[1]
CS450	Project-Seminar II
EB355	Macroeconomics I
H205	Canadian Literature
	Elective[2]

[1] *These courses will be taken in alternate years.*
[2] *Electives must include one course in Agricultural Science and one course in Humanities or Economics.*

Graduates of Newfoundland Grade XII will be considered for direct entry if their average is 65% or higher in University Preparation 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.

Supplemental Examinations

A student who has a mark average of at least 50% and who has passed at least half of the subjects taken may write one supplemental examination in each failed subject in which the mark is 40% or higher. The supplemental examination (or examinations) must be written in the late June supplemental exam period immediately following the failure. A student in the final year may write one supplemental examination in January, 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.

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 no later than June 11th for the June supplemental examination period. 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.)

Years 2, 3 and 4 — Agricultural Soils

Semester III		**Semester IV**	
CS200	Biochemistry I	B225	Microbiology
CS210	Chemical Principles II	B260	Plant Physiology
CS220	Introduction to Soil Science	CS225	Quantitative Analytical Chemistry
MP110	Physics	CS230	Introduction to Geology
MP220	Computer Science	MP200	Statistics

Semester V		**Semester VI**	
B330	Ecology	CS320	Soil Fertility
CS305	Instrumental Analytical Chemistry I	CS335	Soil Physics[2] or CS340 Soil Chemistry[2]
CS325	Soil Genesis and Classification	EB355	Macroeconomics I
	Elective[1]	H205	Canadian Literature
	Elective[1]		*Elective*[1]

Semester VII		**Semester VIII**	
AE340	Soil and Water	CS335	Soil Physics[2] or CS340 Soil Chemistry[2]
B400	Soil Microbiology		
CS430	Soil Survey and Land Evaluation	CS450	Project-Seminar II
CS449	Project-Seminar I		*Elective*[1]
	Elective[1]		*Elective*[1]
			Elective[1]

[1] *Electives must include one Plant Science production course and one Humanities or Economics course.*
[2] *These courses will be offered in alternate years.*

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

The B.Sc. (Agr.) degree course 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:

- Agricultural Economics
- Agricultural Chemistry
- Agricultural Mechanization
- Agricultural Soils
- Animal Science
- Plant Protection
- Plant Science

Other options are available to students if they transfer at the end of their second year to Macdonald College of McGill University, the University of Guelph, or the University of Maine.

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

Years 2, 3 and 4 — Agricultural Economics

Semester III

CS220	Introduction to Soil Science
EB200	Microeconomics I
EB210	Financial Accounting I
EB260	Mathematical Economics
	Elective[1]

Semester IV

EB205	Microeconomics II
EB215	Financial Accounting II
H205	Canadian Literature
MP200	Statistics
	Elective[1]

Semester V

EB310	Cost Accounting
EB335	Business Marketing
EB340	Farm Management I
EB360	Econometrics
	Elective[1]

Semester VI

EB325	Operations Research
EB330	Agricultural Markets and Prices
EB355	Macroeconomics I
MP221	Computer Science
	Elective[1]

Semester VII

EB400	Resource and Environmental Economics
EB425	Research Methods Seminar
EB415	Business Law
	Elective[1]
	Elective[1]

Semester VIII

EB420	Agricultural and Food Policy
EB405	Macroeconomics II
EB440	Farm Management II
	Elective[1]
	Elective[1]

[1] *Electives must include two science subjects and one subject from each of Agricultural Engineering, Animal Science, and Plant Science.*

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

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 5 semester courses in Humanities and Economics
- 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

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

Syllabus

Year 1 – All Options

Semester I		**Semester II**	
B100	Botany	AS100	Introductory Animal Science
CS100	Chemical Principles I	B110	Zoology
H100	Technical Writing	CS110	Organic Chemistry I
MP100	Calculus and Analytic Geometry I	EB110	Agricultural Economics
PS100	Principles of Crop Production	MP105	Calculus and Analytic Geometry II
		MP135	Physics for Life Sciences II

The first academic year of the program is the same regardless of which option a student intends to take. By the time first-year students reach the middle of the Winter Semester (early March), they select one of the following options and register for the second year of that program:

Degree Programs

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

Years 2, 3 and 4 — Agricultural Mechanization

Semester III

AE100	Graphics and Projection
CS220	Introduction to Soil Science
EB210	Financial Accounting I
MP130	Physics for Life Sciences I
MP220	Computer Science

Semester IV

AE110	Statics
AE320	Agricultural Structures
H205	Canadian Literature
MP135	Physics for Life Sciences II
MP200	Statistics

Semester V

AE231	Agricultural Machinery
AE305	Engineering Measurements and Controls
EB340	Farm Management I
	Elective[1]
	Elective[1]

Semester VI

AE325	Agricultural Tractors
EB355	Macroeconomics I
	Elective[1]
	Elective[1]
	Elective[1]

Semester VII

AE340	Soil and Water
AE449	Project-Seminar I
	Elective[1]
	Elective[1]
	Elective[1]

Semester VIII

AE330	Hydrology
AE450	Project-Seminar II
	Elective[1]
	Elective[1]
	Elective[1]

[1]*Electives must include three Agricultural Engineering courses.*

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

Years 2, 3 and 4 — Animal Science

Semester III

B200	Cell Biology
B240	Genetics I
CS200	Biochemistry I
CS220	Introduction to Soil Science
MP110	Physics

Semester IV

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

Semester V

AS300	Animal Physiology
AS305	Animal Nutrition
AS310	Animal Breeding
	Elective[1]
	Elective[1]

Semester VI

AS315	Reproductive Physiology
AS320	Animal Health
AS325	Applied Animal Nutrition
EB355	Macroeconomics I
	Elective[1]

Semester VII

	Elective[1]
	Elective[1]
	Elective[1]
	Elective[1]
	Elective[1]

Semester VIII

AS450	Project-Seminar
	Elective[1]
	Elective[1]
	Elective[1]
	Elective[1]

[1]*Electives must include three animal production, one Humanities or Economics, and one Agricultural (not Animal Science) courses.*

Degree Programs

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

Years 2, 3 and 4 — Plant Protection

Semester III

B200	Cell Biology
B240	Genetics I
B265	Systematic Botany
CS200	Biochemistry I
MP110	Physics

Semester IV

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

Semester V

B300	Principles of Plant Pathology
B310	Mycology
B320	General Entomology
B335	Weed Science
CS220	Introduction to Soil Science

Semester VI

B305	Economic Plant Pathology
B325	Economic Entomology
EB355	Macroeconomics I
MP221	Computer Science
	Elective[1]

Semester VII

B330	Ecology
B449	Project-Seminar I
	Elective[1]
	Elective[1]
	Elective[1]

Semester VIII

B450	Project-Seminar II
H205	Canadian Literature
	Elective[1]
	Elective[1]
	Elective[1]

[1] *Electives must include one Agricultural Engineering course and either H320 or H325.*

Recommended Electives:

B400	Soil Microbiology
B405	Pesticides in Agriculture
MP330	Agrometeorology
	One crop production course.

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

Years 2, 3 and 4 — Plant Science

Semester III

B200	Cell Biology
B240	Genetics I
B265	Systematic Botany
CS200	Biochemistry I
MP110	Physics

Semester IV

B260	Plant Physiology
H205	Canadian Literature
MP200	Statistics
	Crop Production Elective
	Elective[1]

Semester V

B300	Principles of Plant Pathology
B320	General Entomology
B335	Weed Science
CS220	Introduction to Soil Science
	Elective[1]

Semester VI

CS320	Soil Fertility
EB355	Macroeconomics I
	Elective[1]
	Elective[1]
	Elective[1]

Semester VII

PS415	Crop Adaptation
PS449	Project-Seminar I
	Elective[1]
	Elective[1]
	Elective[1]

Semester VIII

PS405	Agronomy or PS410 Horticulture
PS450	Project-Seminar II
	Elective[1]
	Elective[1]
	Elective[1]

[1]*Electives must include one Agricultural Engineering course, two crop production courses and one Humanity or Economics course. Agronomy majors must include PS305 in Semester V and PS300 in Semester VII.*

Recommended Electives:

B245	Genetics II (Prerequisite: B240)
CS205	Biochemistry II (Prerequisite: CS200)
EB340	Farm Management I
MP220 or MP221	Computer Science
MP330	Agrometeorology (Prerequisite: MP110 or MP130)
PS400	Plant Breeding (Prerequisites: B240, MP200, one crop production course; Corequisite:B245)

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.

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.

Minimum 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%.

Engineering Diploma

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

These courses are recognized by TUNS and graduates are accepted without examination into the third year of a five-year program in any of the eight engineering departments of TUNS or may apply to any other institution with engineering programs.

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

Minimum 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%.

Degree Programs

Agricultural Engineering Diploma

Syllabus

Year 1

Semester I

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

Semester II

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

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
	Humanities Elective
	Elective[1]

Semester VI

AE315	Strength of Materials
AE320	Agricultural Structures
AE350	Fluid Mechanics
	Humanities Elective
	Elective[1]

[1]*One elective must be an Agricultural Engineering course.*

Degree Programs

Engineering Diploma — B.Eng.

Syllabus

Year 1

Semester I		**Semester II**	
AE100	Graphics and Projection	AE110	Statics
CS100	Chemical Principles	CS110	Organic Chemistry I
H100	Technical Writing	EB110	Agricultural Economics[1]
MP100	Calculus and Analytic Geometry I	MP105	Calculus and Analytic Geometry II
MP130	Physics for Life Sciences I	MP135	Physics for Life Sciences II

Year 2

Semester III		**Semester IV**	
AE220	Dynamics I	AE205	Graphics and Design
AE310	Thermodynamics	AE225	Dynamics II
MP220	Computer Science	AE315	Strength of Materials
MP230	Multivariable Calculus	AE350	Fluid Mechanics
MP300	Electric Circuits	H150	Agriculture Today[3]
H140	Personnel Management[2]	MP235	Differential Equations and Linear Algebra

[1] *May substitute H150 Agriculture Today, H140 Personnel Management, or H325 Technology in Agricultural Communications if timetable permits.*
[2] *May substitute H320 Extension Education in the Rural Community if timetable permits.*
[3] *May substitute H140 Personnel Management, H325 Technology in Agricultural Communications, or H125 Sociology II 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 three-year program at NSAC.

Syllabus

Year 1

Semester I		**Semester II**	
B100	Botany	AS100	Introductory Animal Science
CS100	Chemical Principles I	B110	Zoology
H100	Technical Writing	CS110	Organic Chemistry I
MP100	Calculus and Analytic Geometry I	EB110	Agricultural Economics
MP130	Physics for Life Sciences I	MP105	Calculus and Analytic Geometry II
		MP135	Physics for Life Sciences II

Year 2

Semester III		**Semester IV**	
B200	Cell Biology	B225	Microbiology
B240	Genetics I	B245	Genetics II
CS200	Biochemistry I	CS205	Biochemistry II
CS220	Introduction to Soil Science	H205	Canadian Literature
PS100	Principles of Crop Production	MP200	Statistics

Year 3

Semester V		**Semester VI**	
AS300	Animal Physiology	AS325	Applied Animal Nutrition
AS305	Animal Nutrition	EB355	Macroeconomics I
AS310	Animal Breeding	MP221	Computer Science
B340	Comparative Vertebrate Anatomy		*Humanity or Social Science*
	Humanity or Social Science		*Humanity or Social Science*

At the successful completion of this Pre-Vet program, the student has also completed three of the four years of the B.Sc. (Agr.) program. Those who do not proceed to the D.V.M. program at U.P.E.I. may continue for one more year at NSAC to obtain their B.Sc. (Agr.) degree. Those who graduate in the Animal Science or other options may apply to other universities for graduate studies leading to a M.Sc. and/or a Ph.D. degree in one of the many specializations in Animal Science (Animal Physiology, Animal Nutrition, Animal Breeding, etc.) or other fields of agricultural science.

Pre-Tech Semester

The Nova Scotia Agricultural College offers a program of studies designed to prepare high school graduates for entrance to the technician programs. The period of study will be from early January until late April (see sessional dates for 1990-91 session).

Candidates may be considered who lack 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.

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.

Entrance Requirements

All candidates for admission

- should be 18 years of age on or before the opening day of the College year (mature younger candidates will be considered);
- must 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;
- must present themselves for a selection interview when required.

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

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

Possession of the minimum entrance requirements does not guarantee admission.

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%.

Supplemental Examinations

A student in a technician program may write a supplemental examination in up to half of the courses for which he/she is enrolled if the combined average for all courses is above 50% and the mark in each failed subject is at least 40%.

Six supplemental exams is the maximum number a student is permitted to write over the duration of any program of study.

Provided that the disqualifying conditions stated above do not apply, a student may write one supplemental examination in a course in the June supplemental exam period immediately following the failure.

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

Application for permission to write a supplemental examination in June must be submitted to the Registrar's Office before June 11.

The fee for a supplemental examination in any course is $100. If a student does not show up for a 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, be permitted to write, upon payment of a fee of $100 per examination. There will be no refund in this case.

Agricultural Colleges Exchange Program

This program provides an opportunity for technical students in several of the courses 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.

Agricultural Business

The Nova Scotia Agricultural College offers a two-year program in Agricultural Business to help students prepare themselves 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

Year 1

Semester I

Animal Science		Plant Science		Agricultural Engineering	
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		*Humanities course*

Technician Programs

Syllabus

Agricultural Business with a minor in

Animal Science		**Plant Science**		**Agricultural Engineering**	
Year 2					
Semester III					
AS34	Animal Nutrition	B43	Entomology	AE30	Farm Machinery[3,4]
B20	Animal Physiology	EB40	Marketing Practices	EB40	Marketing Practices
EB40	Marketing Practices	EB65	Business Project	EB65	Business Project
EB65	Business Project	EB340	Farm Management I	EB340	Farm Management I
EB340	Farm Management I	PS53	Vegetable Production[2]	MP15	Introductory Physics
	Humanities course		*Humanities course*	PS40	Field Crops I
Semester IV					
AS35	Feeds & Feeding	B40	Plant Pathology	AE34	Farm Tractors[3,4]
AS50	Dairy Production[1]	EB41	Business Law	AE38	Horticultural Engineering
AS51	Beef & Sheep Production[1]	EB42	Applied Farm Management	EB41	Business Law
AS52	Swine Production[1]	EB220	Production Economics	EB42	Applied Farm Management
EB42	Applied Farm Management	PS49	Potato Production[2]	EB220	Production Economics
EB220	Production Economics	PS76	Plant Products Physiology	PS41	Field Crops II

[1] *May substitute another animal production course if timetable permits.*
[2] *May substitute PS43 Small Fruit Crops and PS44 Tree Fruit Crops if timetable permits.*
[3] *May substitute MP15 Introductory Physics, AE32 Farm Buildings, and AE36 Controls and Processing if timetable permits.*
[4] *May substitute AE14 Surveying and AE45 Soil and Water Management if timetable permits.*

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

A student who has successfully completed the two years of Agricultural Business with a good study record may apply for consideration to pursue a one-year program in Agricultural Technology.

Agricultural Engineering

The Nova Scotia Agricultural College offers a two-year program to help students prepare themselves for careers on farms or in farm-related firms with specialization in the efficient use and maintenance of the resources 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		**Semester II**	
AE12	Drafting	AE19	Technical Drawing
AE13	Shopwork	AE20	Shopwork Practices
AE14	Surveying	AE27	Welding
CS12	Principles of Soil Science	MP14	Computational Methods
EB10	Accounting	MP15	Introductory Physics
H10	Technical Writing		*Elective*[1]

Year 2

Semester III		**Semester IV**	
AE30	Farm Machinery	AE36	Controls & Processing
AE32	Farm Buildings	AE65	Project-Seminar
AE45	Soil and Water Management	AS30	Animal Science
AE49	Electrical Systems		*Humanities course*
AE63	Tractor Power		*Elective*[1]
PS40	Field Crops I		*Elective* [1]

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

A student who has successfully completed the first year with a good study record may apply for consideration to pursue 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 consideration to pursue a one-year program in Agricultural Technology.

Animal Science

The Nova Scotia Agricultural College offers a two-year program in Animal Science to help students prepare themselves 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			
AS34	Animal Nutrition	AE12	Drafting
B20	Animal Physiology	AS34	Animal Nutrition
CS12	Principles of Soil Science	CS12	Principles of Soil Science
CS14	Agr. Chemistry	B20	Animal Physiology
EB10	Accounting	CS14	Agr. Chemistry
H10	Tech. Writing	H10	Tech. Writing

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

Semester II			
AS15	Animal Genetics & Breeding	AS15	Animal Genetics & Breeding
AS33	Applied Animal Physiology	AS33	Applied Animal Physiology
AS35	Feeds & Feeding	AS35	Feeds & Feeding
CS13	Soil Management	CS13	Soil Management
EB11	App. Acct. & Taxation		*Humanities course*
MP14	Computational Methods	MP14	Computational Methods

Technician Programs

Syllabus

Animal Science with minor in

Agricultural Business		**Agricultural Engineering**	
Year 2			
Semester III			
AS47	Animal Health	AE32	Farm Buildings[3] [4]
AS53	Poultry Production[1]	AS47	Animal Health
AS65	Project-Seminar	AS53	Poultry Production[1]
EB340	Farm Management I	AS65	Project-Seminar
	Humanities course	MP15	Introductory Physics
PS40	Field Crops I	PS40	Field Crops I
Semester IV			
AS50	Dairy Production[2]	AE36	Controls & Processing[3] [4]
AS51	Beef & Sheep Production[2]	AS50	Dairy Production[2]
AS52	Swine Production[2]	AS51	Beef & Sheep Production[2]
AS55	Fur Production[2]	AS52	Swine Production[2]
EB41	Business Law	AS55	Fur Production[2]
PS41	Field Crops II	PS41	Field Crops II

[1] *May substitute AS54 Horse Management if timetable permits.*
[2] *May substitute AS37 Laboratory Animal Care I if timetable permits.*
[3] *May substitute AE34 Farm Tractors and AE30 Farm Machinery if timetable permits.*
[4] *May substitute AE14 Surveying and AE45 Soil and Water Management if timetable permits.*

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

A student who has successfully completed the two years of Animal Science with a good study record may apply for consideration to pursue a one-year program in Agricultural Technology.

Farm Equipment

The Nova Scotia Agricultural College offers a two-year program to help students prepare themselves 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	Agr. Chemistry
EB10	Accounting
H10	Tech. 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 Program

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 course

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 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

Plant Science with specialization in

Agronomy		**Horticulture**		**Ornamental Horticulture**	
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	Hort. Engineering	AE38	Hort. 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	Agricultural Crops	PS30	Agricultural Crops	PS38	Nursery Crop Production

Syllabus

Plant Science with specialization in

Agronomy		**Horticulture**		**Ornamental Horticulture**	
Year 2					
Semester III					
AE30	Farm Machinery	MP15	Introductory Physics	PS39	Greenhouse Crop Production
AS34	Animal Nutrition[1]	PS39	Greenhouse Crop Production	PS43	Small Fruit Crops
EB340	Farm Management I	PS40	Field Crops I	PS47	Turfgrass Production and Management[1]
	Humanities course	PS43	Small Fruit Crops	PS50	Landscape Horticulture I
MP15	Introductory Physics	PS47	Turfgrass Production and Management[1]	PS53	Vegetable Production[1]
PS40	Field Crops I	PS53	Vegetable Production[1]	PS60	Landscape Plant Materials I
Semester IV					
AE34	Farm Tractors	B40	Plant Pathology	B40	Plant Pathology
AS35	Feeds and Feeding[1]		*Humanities course*	H140	Personnel Management
B40	Plant Pathology	PS38	Nursery Crop Production	PS44	Tree Fruit Crops
EB41	Business Law	PS41	Field Crops II	PS57	Landscape Maintenance
PS41	Field Crops II	PS44	Tree Fruit Crops or PS49 Potato Production	PS61	Landscape Plant Materials II
PS49	Potato Production	PS76	Plant Products Physiology	PS76	Plant Products Physiology

[1]*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 consideration to pursue 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 consideration to pursue a one-year program in Agricultural Technology.

Technology Programs for High School Graduates

The Nova Scotia Agricultural College offers specialized programs to help persons prepare themselves for careers associated with laboratory techniques in Animal Health, Biology, and Chemistry, and with the practice of Landscape Horticulture. These studies respectively lead to a Diploma of Technology (Dipl. T.) in Animal Health, a Diploma of Technology (Dipl. T.) in Biology, a Diploma of Technology (Dipl. T.) in Chemistry, and a Diploma of Technology (Dipl. T.) in Landscape Horticulture.

Entrance Requirements for Animal Health, Biology, Chemistry Laboratory, Food Laboratory, and Landscape Horticulture Technology

A candidate for a Diploma of Technology may qualify for admission to the two-year programs in one of two ways:

- following high school completion. See syllabus of each program for specific admission requirements.
- completion of degree or technical courses equivalent to the above in other post-high-school courses.

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

Each candidate must be available for an interview when requested.

Accepted candidates will follow the syllabus for the program in which they have registered. Descriptions of individual courses are found in the Description of Courses section of this Calendar.

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%.

Animal Health Technology

The Animal Health Technology program is designed to prepare graduates with the skills and knowledge required to function as technical assistants to veterinarians in practice, 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.

Technology Programs for High School Graduates

Syllabus
Animal Health

Year 1

Semester I

AS34	Animal Nutrition
B15	Animal Anatomy
B20	Animal Physiology
CS42	Organic Chemistry
EB10	Accounting
H10	Technical Writing

Semester II

AS10	Orientation to An. Health
AS15	Animal Genetics & Breeding
AS30	Animal Science
AS37	Laboratory Animal Care I
B225	Microbiology
CS43	Bio-Organic Chemistry

Year 2

Semester III

AS24	Principles of Disease
AS25	Animal Nursing & Clin. Proc. I
AS28	Service Lab. Procedures I
AS39	Veterinary Lab Techniques I
AS47	Animal Health
AS48	Animal Behavior

Semester IV

AS36	Principles of Pharmacology
AS38	Service Lab. Procedures II
AS46	Animal Nursing & Clin. Proc. II
AS49	Veterinary Lab Techniques II
H45	Technical Communication
MP14	Computational Methods

Year 3

Semester IV (May-December)[1]

AS85	Animal Health Practicum (Off-Campus learning experiences at arranged locations and debriefing at the NSAC)

Semester VI

AS58	Service Lab. Procedures III
AS59	Veterinary Lab. Techniques III
AS71	Laboratory Animal Care II
AS75	Animal Nursing & Clin. Proc. III
AS95	Animal Health Technology Project
H140	Personnel Management
MP70	Basic Statistics

Technology Programs for High School Graduates

Biology Technology

The Nova Scotia Agricultural College offers a program in Biology Technology 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 (IPM)
- technologists to assist data acquisition of forestry or silviculture related programs
- technologists trained to work in the life sciences

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.

Technology Programs for High School Graduates

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
CS30	Chemical Calculations
CS12	Principles of Soil Science

Semester IV

AS15	Animal Genetics and Breeding
B40	Plant Pathology
B41	Plant Physiology
B48	Plant Tissue Culture
B55	Food Microbiology

Year 3

Semester V

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

Semester VI

AS37	Laboratory Animal Care I
B46	Weed Science
B60	Biology Practicum II
B75	Biological Photography
MP70	Basic Statistics

Technology Programs for High School Graduates

Chemistry Laboratory Technology

The Nova Scotia Agricultural College offers a 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, 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		**Semester II**	
CS42	Organic Chemistry	AS30	Animal Science[1]
CS45	Qualitative Analysis	B225	Microbiology
CS68	Introductory Laboratory Techniques	CS43	Bio-Organic Chemistry
CS100	Chemical Principles I (lectures only)	CS225	Quantitative Analytical Chem.
H10	Tech. Writing	MP70	Basic Statistics
MP100	Calculus & Analytical Geometry I	MP221	Computer Science

Year 2

Semester III		**Semester IV**	
CS50	Introduction to Physical Chemistry	CS73	Laboratory Organization and Management
CS75	Basic Food Chemistry	CS80	Project Implementation
CS79	Project Organization	CS310	Radiotracers in Agriculture
CS220	Introduction to Soil Science	CS315	Instrumental Analytical Chemistry II
CS305	Instrumental Analytical Chemistry I	CS350	Food Chemistry
PS100	Principles of Crop Production	H150	Agriculture Today

[1] *AS100 Introductory Animal Science can be substituted if timetable permits.*

Technology Programs for High School Graduates

Food Laboratory Technology

The Nova Scotia Agricultural College offers a program in Food Laboratory Technology to prepare students for employment as:

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

Academic Entrance Requirements

High School Graduation Certificate with pass marks and an average of at least 60% in Biology, Chemistry, 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

CS15	Microcomputer Applications
CS42	Organic Chemistry
CS68	Introductory Laboratory Techniques
CS100	Chemical Principles I (lectures only)
H10	Technical Writing

Semester II

AS100	Introductory Animal Science
B225	Microbiology
CS43	Bio-Organic Chemistry
CS225	Quantitative Analytical Chemistry
MP70	Basic Statistics

Year 2

Semester III

AS345	Eggs and Dairy Products
CS30	Chemical Calculations
CS75	Basic Food Chemistry
CS305	Instrumental Analytical Chemistry I
MP15	Introductory Physics

Semester IV

AE350	Fundamentals of Food Processing
B41	Plant Physiology
B55	Food Microbiology
CS40	Food Laboratory Methods
H150	Agriculture Today

Year 3

Semester V

CS85	Food Laboratory Practicum

Semester VI

AS350	Meat Science
CS55	Food Packaging & Consumer Acceptability
CS315	Instrumental Analytical Chemistry II
CS350	Food Chemistry
PS76	Plant Products Physiology

Technology Programs for High School Graduates

Landscape Horticulture Technology

The Nova Scotia Agricultural College offers a two-year program to help students prepare themselves 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

Year 2

Semester III

AE14	Surveying
B43	Entomology
EB10	Accounting
H140	Personnel Management
PS39	Greenhouse Crop Management
PS71	Arboriculture
PS73	Landscape Horticulture II

Semester IV

B46	Weed Science
H60	Communication Techniques
MP14	Computational Methods
PS38	Nursery Crop Production
PS72	Landscape Maintenance
PS74	Landscape Design and Construction

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.

Agricultural Technology

The College also offers courses designed to help technicians become more proficient in their chosen fields of agricultural endeavor. 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 endeavor.

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 independent project study, based on performance in the previous technician or equivalent programs. 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.

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[1]
AE36	Controls & Processing
AS100	Introductory Animal Science
EB110	Agricultural Economics
MP105	Calculus and Analytic Geometry II
MP221	Computer Science

Summer Session

AE260	Surveying — 2 weeks

Year 2

Semester III

AE79	Technology Project
AE305	Engineering Measurements and Controls
AE231	Agricultural Machinery
AE335	Materials Handling and Processing
AE340	Soil and Water
	Approved elective

Semester IV

AE80	Technology Report
AE320	Agricultural Structures
AE345	Energy in Agriculture
H60	Communication Techniques
	Approved elective
	Approved elective

[1] *If students have completed AE27, but not AE19 Technical Drawing, then AE19 will be required during the semester.*

Technology Programs for Technician Graduates

Farming Technology

The Nova Scotia Agricultural College offers a 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 must be completed before Semester I.

Year 1 Required Subjects

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
M15	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

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

Technology Programs for Technician Graduates

Year 2 Required Subjects

Semester IV

EB42 Applied Farm Management
EB72 Farm Project

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.

Approved Electives

Semester I

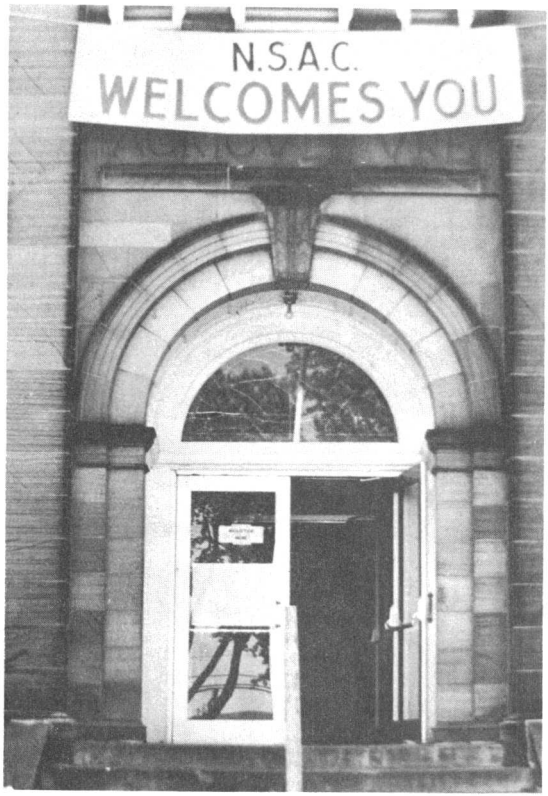
AE12	Drafting
AE13	Shopwork
AE14	Surveying
AE30	Farm Machinery
AE32	Farm Buildings
AE45	Soil and Water Management
AS34	Animal Nutrition
AS47	Animal Health
AS53	Poultry Production
AS54	Horse Management
B20	Animal Physiology
B43	Entomology
EB12	Macroeconomics
PS10	Plant Production Practices
PS39	Greenhouse 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
AS15	Animal Genetics and Breeding
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	Agricultural Crops
PS38	Nursery Crop Production
PS44	Tree Fruit Crops
PS49	Potato Production
PS76	Plant Products Physiology

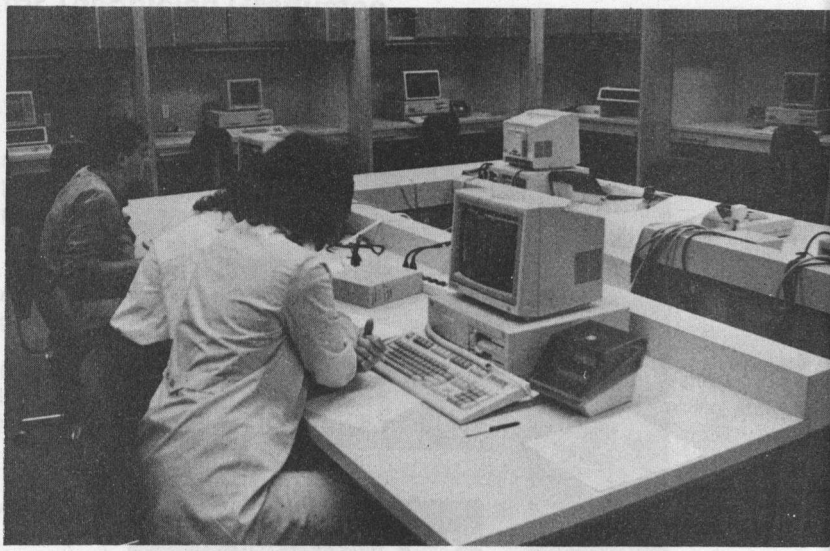
Students who complete all the requirements with no mark below 50% of the maximum mark obtainable will be granted a Diploma of Technology (Dipl. T.).

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.

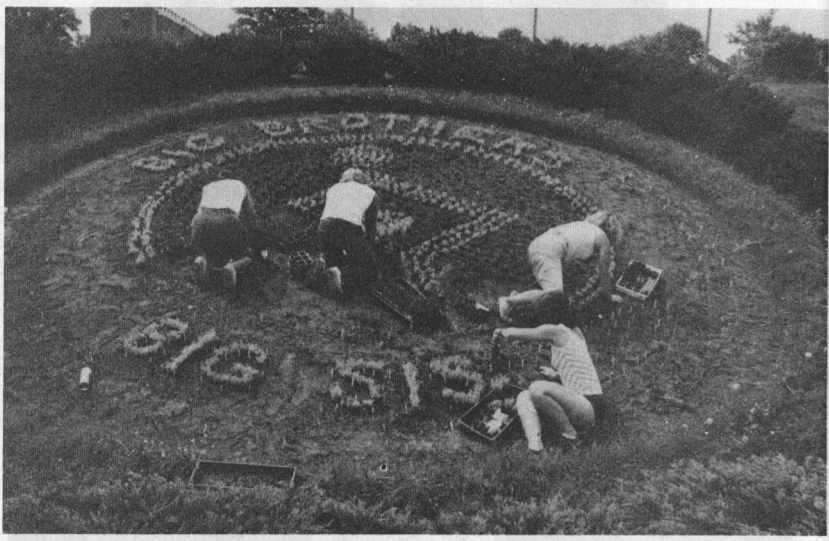


Since 1905

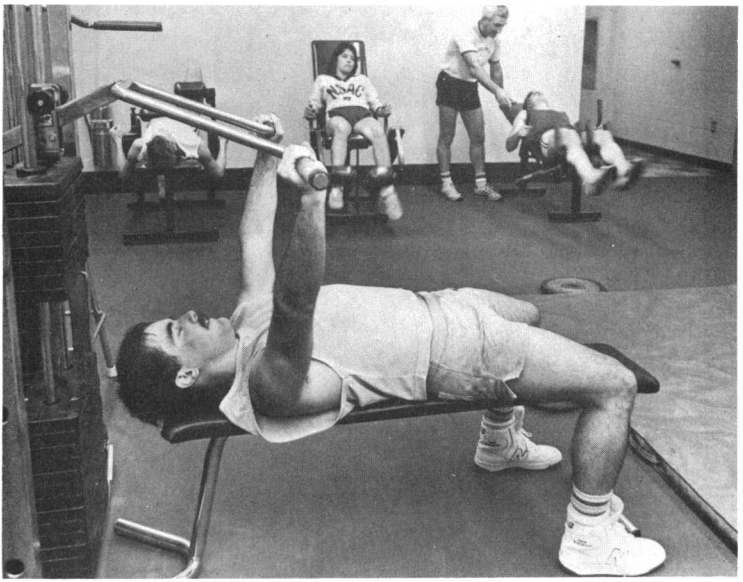
Registration



Computing

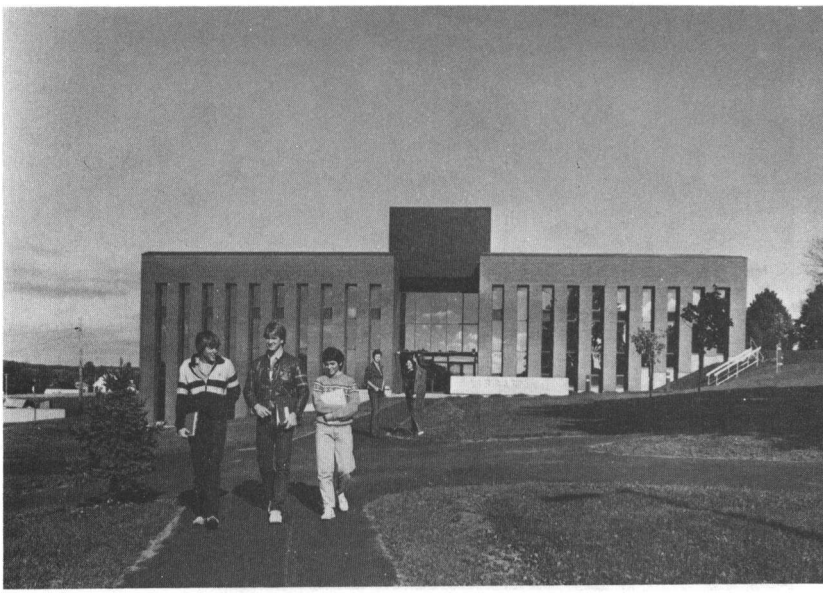


Landscaping



After this ...

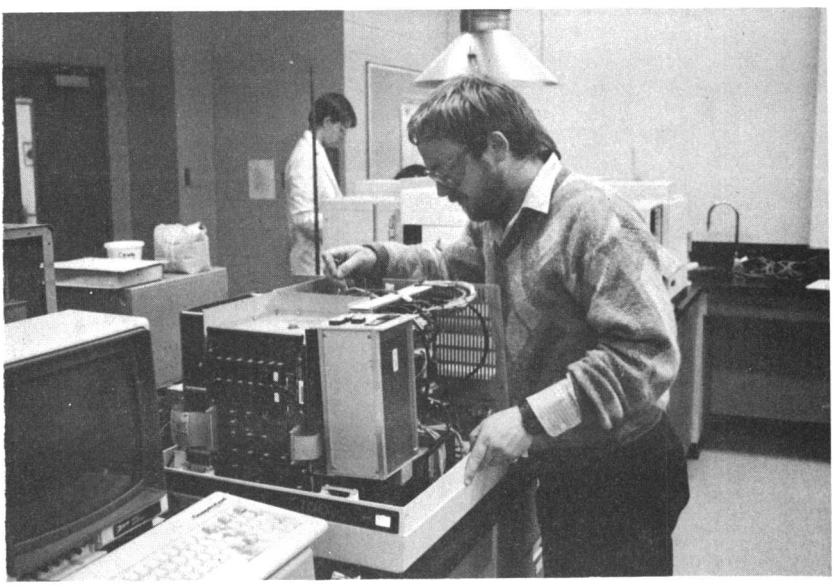
This



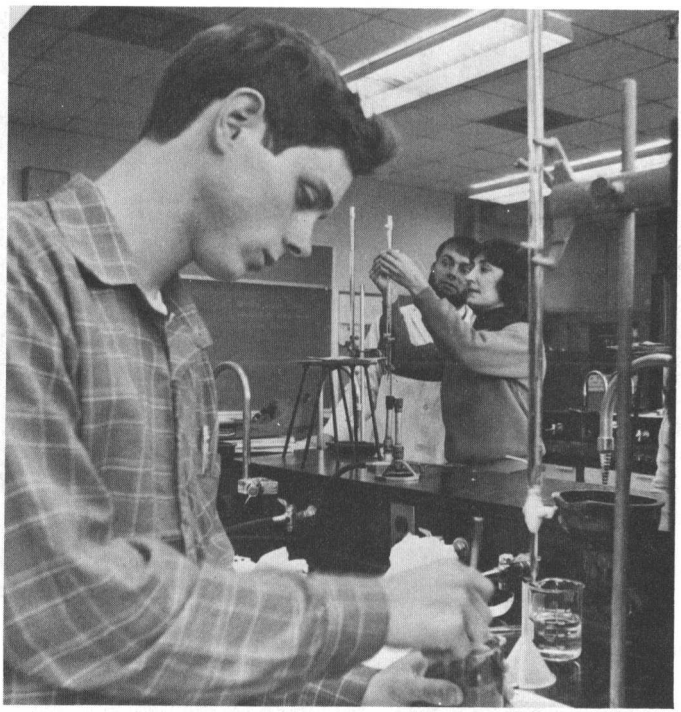
Talking it over

Turning it over

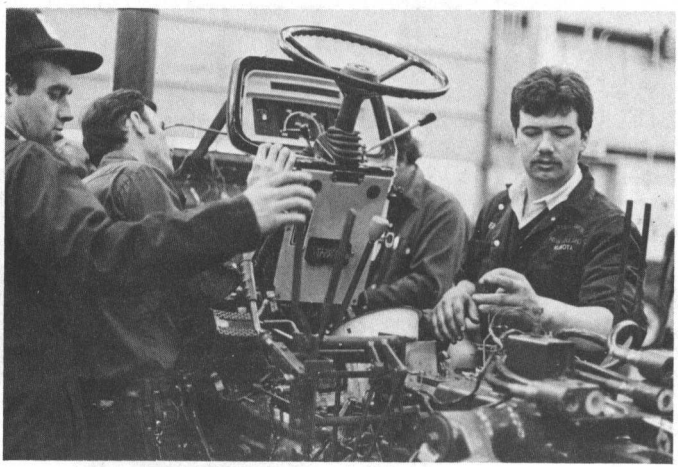
Easy living



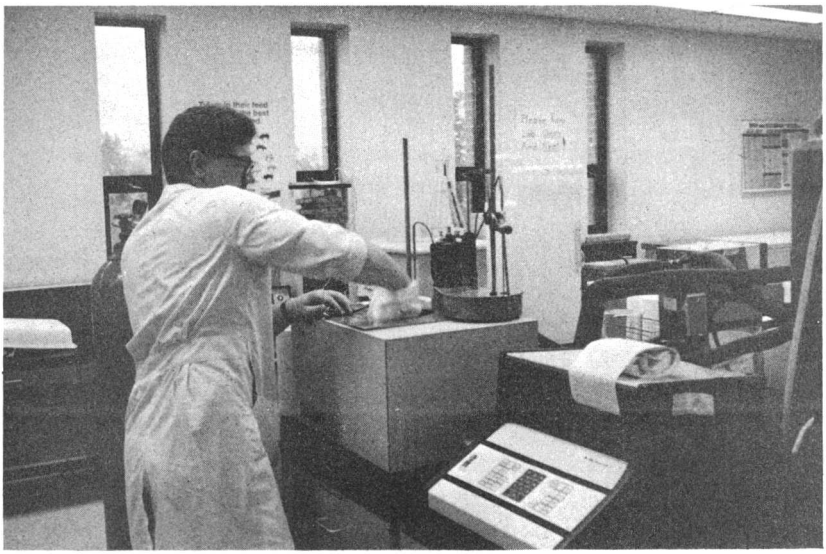
1, 2, 3, 4 ...



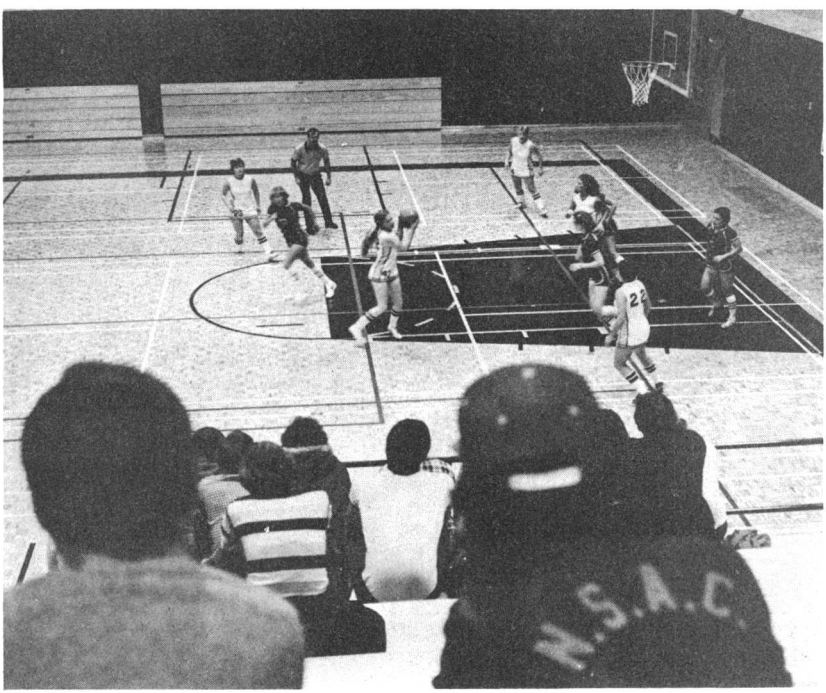
What is it?



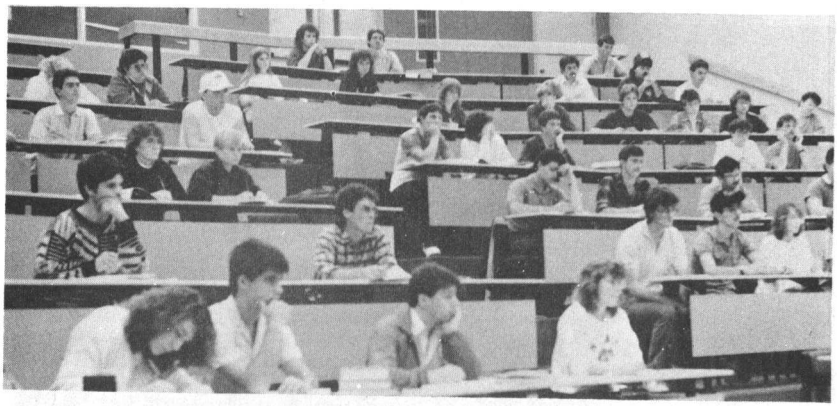
Will it go back together?



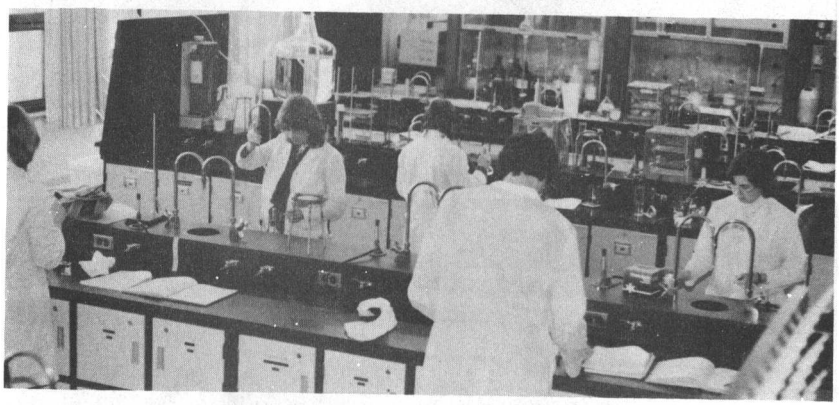
Hands on



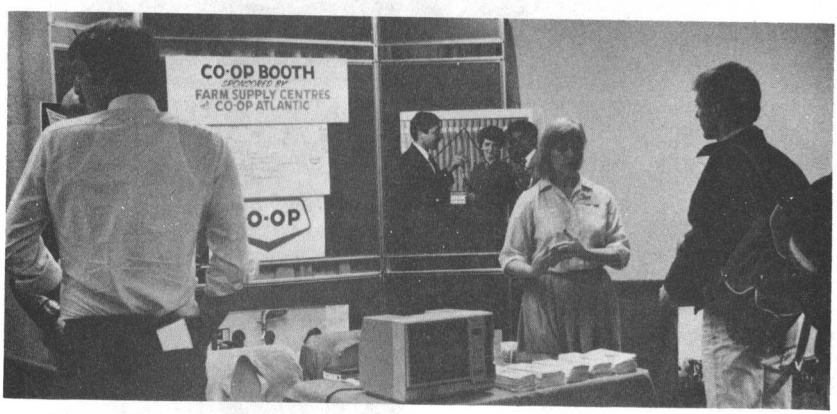
Dunk it



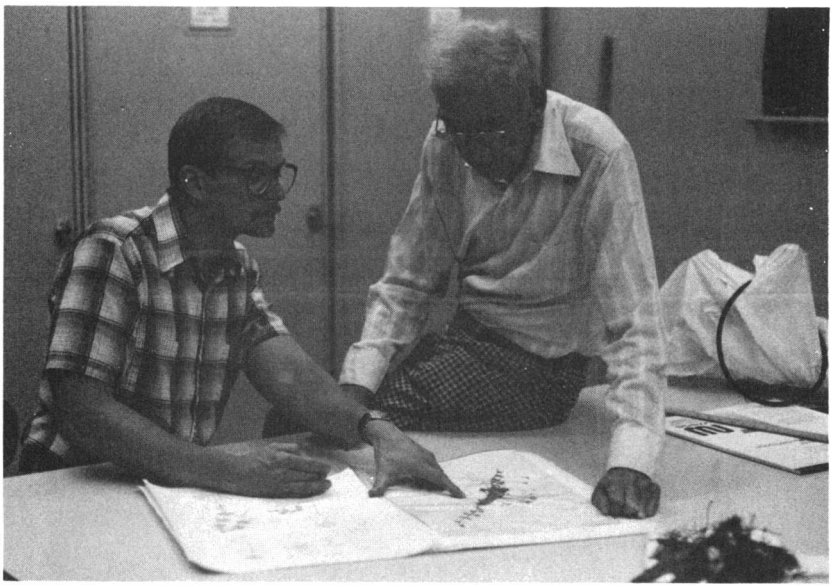
Listening and _____



Doing and _____



Job seeking



Faculty here ...

and around the Globe

Returning Alumni (1979) and ...

New Alumni

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. Cunningham**
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
Instructor: **Prof. Havard and Messrs. Hampton and Bhola**
The selection, operation, and maintenance of workshop tools, including the power grinder, drill press, fly press, metal- and wood-cutting bandsaws, iron worker, metal bender, squaring shears, box and pan and cornice brake, and forming rolls; and of woodworking equipment such as the table saw, jointer, thicknesser, radial-arm saw and a wood lathe; also use of portable wood- and metalworking tools. Students are introduced to the operation of a metal lathe and milling machine. Considerable welding is done using electric, acetylene, and spot-welding machines. Some practice is given on the hard-to-weld metals such as aluminum and magnesium alloys. Identification and heat treatment of metals are also studied.

Fall semester — 2 lecs and 4 labs per week.

AE14: Surveying
Instructor: **Prof. Madani**
An introduction to surveying principles and recording techniques. Fall students are given lectures and assignments to assist in understanding the principles employed in surveying, and they practise these during the łabs 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.

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. Bhola and Hampton**
Prerequisite: AE13
Consists of individual projects, undertaken by students, using the skills acquired in shopwork. These projects are selected by the student from prescribed projects and may be of metal or wood or a composite, utilizing the shop equipment and machinery in the metalworking, welding, and woodworking shops. Projects are agriculturally oriented.

Winter semester — 2 lecs and 4 labs per week.

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.

Agricultural Engineering

AE27: Welding
Instructor: **To be announced.**
Prerequisite: AE13
Principles and practices of oxyacetylene and electric arc welding, cutting and brazing of cast iron and steel in flat, vertical, and overhead positions. Safety precautions, electrode selection, welding and spot-welding machine design are investigated. Demonstrations and practices include ferrous and non-ferrous welding. Weld strength may be determined by the use of a modern tensile testing machine.

Winter semester — 2 lecs and 4 labs per week.

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

AE30: Farm Machinery
Instructor: **To be announced.**
Operating principles of the basic types of farm machinery: tilling, planting, chemical and fertilizer application, harvesting, and haymaking equipment are studied. Laboratory periods emphasize adjustment, calibration, and maintenance of the machinery, as well as safety.

Fall semester — 2 lecs and 4 labs per week.

Text — Culpin, *Farm Machinery* (11th edition).

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: **To be announced.**
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, driers, 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. To be first offered in 1991-92.

AE36: Controls and Processing
Instructor: **Prof Cunningham**
Prerequisite: AE12
Preparatory: AE32
The study of AC and its application in the processing and handling of various farmstead materials. Students gain knowledge of basic wiring, special switches and controls, AC motor operation, and electric heaters, enabling them to identify troubles during critical situations and to correct them. Processing and handling methods and the related equipment are studied. The area of materials handling is explored through various problems and assignments, and field visits are arranged for students to view various related materials-handling equipment.

Winter semester — 2 lecs and 4 labs per week.

Text — Gustafson, *Fundamentals of Electricity for Agriculture*.

AE38: Horticultural Engineering
Instructor: **To be announced.**
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: **To be announced.**
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.

Agricultural Engineering

AE40: Field Equipment Overhaul
Instructor: **To be announced.**
Prerequisite: AE30
Preparatory: AE20
Experience in overhauling of field equipment is given by developing a system of inspection, estimating repairs and parts required, and developing probable cost. Overhauling of equipment is carried out, and appropriate records and tests are made.

Winter semester — 1 lec and 6 labs per week.

Text — John Deere, *FOS: Identification of Parts Failures*

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. Laboratory periods cover design problems, project field labs, and tours.

Fall semester — 2 lecs and 4 labs per week.

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: **To be announced.**
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: **To be announced.**
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, *FMO: Tractor Power.*

AE65: Project-Seminar
Coordinator: **Prof. Adams**
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**
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.

Winter semester — 1 lec and 6 labs per week.

AE79: Technology Project
Coordinator: **Prof. Adams**
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: **Prof. Adams**
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.

Agricultural Engineering

AE90: Technology Project
Coordinator: **Prof. Adams**
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. Adams**
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 — Levens, Chalk, *Graphics in Engineering Design.*

AE110: Statics (EN)
Instructor: **Prof. Allen**
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.*

AE205: Graphics and Design (EN)
Instructor: **Prof. Adams**
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 — Levens, Chalk, *Graphics in Engineering Designs.*

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.*

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.*

Agricultural Engineering

AE260: Surveying (EN)
Instructor: **Prof. Madani**
Prerequisite: MP100
Preparatory: MP105
An introduction to the use of surveying instruments and practices. Distance measurements, differential and profile leveling, and transit traverses 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
Introduces measurement fundamentals and examines techniques for measuring and controlling pressure, stress, strain, temperature, humidity, etc. Laboratory work will identify agricultural engineering measuring problems and instrumentation, and measurements will be carried out in conditions experienced in agriculture. Various measuring instruments will be used, including computers and microprocessors, for measurement and control applications.

Fall semester — 3 lecs and 3 labs per week.

Text — Moore, *Basic Instrumentation Lecture Notes and Study Guide,* Instrument Society of America.

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.

Fall semester — 3 lecs and 3 labs per week.

Text — Howell, Buckius, *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 — Bowes, Russell, Suter, *Mechanics of Engineering 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.

Winter semester — 3 lecs and 3 labs per week.

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

AE325: Agricultural Tractors (AE)
Instructor: **To be announced.**
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 — Jones and Alfred, *Farm Power and Tractors.*

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, and applications to agricultural engineering problems.

Winter semester — 3 lecs and 3 labs per week.

AE335: Materials Handling and Processing (AE)
Instructor: **Prof. Cunningham**
Prerequisite: MP105
Preparatory: MP110 or MP130
Conception and operating principles of handling and processing equipment used on the farm. Characteristics, selection, and design are covered. Principles of system analysis and operation research are introduced.

Fall semester — 2 lecs and 4 labs per week.

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

Agricultural Engineering

AE340: Soil and Water (AE)
Instructor: **Prof. Madani**
Prerequisite: MP105
Corequisite: CS220
Fundamental hydrology related to soil and water products in agriculture. Design criteria for land drainage, land forming, land clearing, irrigation, and ditching. Special problems inherent in Atlantic agriculture are studied, such as marsh reclamation, erosion control practices, and stream bank stabilization.

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
Preparatory: MP110 or MP135
Introduction to the world energy situation and use of energy in agriculture and food production. Production and conversion of energy in rural conditions. Energy use and conservation in field production and tractor operation, animal production, horticultural and greenhouse production, and in irrigation and water management practices.

Winter semester — 3 lecs and 3 labs per week.

Text — Stout, *Energy for World Agriculture,* FAO.

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, flow measurement, viscous flow, and dimensionless numbers.

Winter semester — 3 lecs and 2 labs per week.

Text — Robertson and Crowe, *Engineering Fluid Mechanics* (3rd edition).

AE400: Agricultural Mechanization Systems (AE)
Instructor: **To be announced.**
Prerequisite: AE231
Fundamental principles of machinery selection for particular cropping systems will be studied. Principles will be developed for matching equipment type and size and tractor power for maximum efficiency, according to energy, cultivation, cropping soil, and cost consideration. A term project is required in which the principles and techniques presented in the course will be used, as well as library and other sources.

Winter semester — 2 lecs and 4 labs per week.

Text — Hunt, *Farm Power and Machinery Management* (8th edition).

AE449: Project-Seminar I (AE)
Coordinator: **Prof. Adams**
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 preceeding their final year, if necessary.

Fall semester — 1 scheduled seminar session per week.

AE450: Project-Seminar II (AE)
Coordinator: **Prof. Adams**
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.

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 practiced in assigned periods of duty in the College's facilities. The topic 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.

Winter semester — 4 lecs per week.

AS15: Animal Genetics and Breeding
Instructor: **Prof. Patterson**
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.

AS24: Principles of Disease
Instructor: **To be announced.**
Prerequisites: AS10, B15, B20, B225
Corequisite: AS28, 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.

Fall semester — 3 lecs per week.

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. Performance should demonstrate observance of principles and good manual skills which suggest that improvement will follow opportunities to practise in later similar courses and the externship period.

Fall semester — 4 lecs and 4 labs per week.

AS28: Service Laboratory Procedures I
Instructor: **N.S. Vet. Lab. Pathology Staff**
Prerequisite: B225
Corequisite: AS24, AS39
The courses in Service Laboratory Procedures form a continuum within the second and third years of the AHT Program. Students will learn about the procedures and techniques common to Veterinary Diagnostic Laboratories including necropsy and other related procedures. While serving in the Veterinary Laboratory, students gain experience with those clinical laboratory techniques which are not commonly performed in the veterinary hospital laboratory.

Fall semester — 1 lec and 1 lab 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 and use 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.**
Examines the place of livestock on Atlantic region farms, with some emphasis on the integration of crops and livestock. 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.

Animal Science

AS33: Applied Animal Physiology
Instructor: **To be announced.**
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: **Prof. Cock**
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 needs for and use of specific nutrients.

Fall semester — 3 lecs per week.

AS35: Feeds and Feeding
Instructor: **Prof. Cock**
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: **To be announced**
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 examined. Various costing formulae used in veterinary practices are used in simulated exercises.

Winter semester — 3 lecs per week.

AS37: Laboratory Animal Care I
Instructor: **Prof. Crober**
Prerequisites: B20, AS34
Designed to instruct the student in the proper care and handling of the laboratory animal. Characteristics and requirements of relevant species are reviewed. Additional techniques learned are those regularly used in research and teaching.

Winter semester — 2 lecs and 2 labs per week.

AS38: Service Laboratory Procedures II
Instructor: **N.S. Vet. Lab. Pathology Staff**
Prerequisites: AS24, AS28
Corequisite: AS49
A continuation of Service Laboratory Procedures I.

Winter semester — 1 lec and 1 lab per week.

AS39: Veterinary Laboratory Techniques I
Coordinator: **Prof. Ramsay**
Prerequisites: B225, CS42
Corequisite: AS24, AS28
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 practiced. 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 which suggest that improvement will follow opportunities to practice in later similar courses and the externship period.

Fall semester — 3 lecs and 4 labs per week.

AS46: Animal Nursing and Clinical Procedures II
Instructor: **To be announced.**
Prerequisites: AS24, AS25, AS36
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, which suggest that further improvement will follow opportunities to practise during AS85 Practium experience.

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

Winter semester — 2 lecs and 1 lab per week.

AS49: Veterinary Laboratory Techniques II
Coordinator: **Prof. Ramsay**
Prerequisite: AS39
Corequisite: AS38
This course continues the general format of Laboratory Procedures I concentrating on hematology, 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, which suggest that improvement will follow opportunities to practise in later laboratory courses and the externship period.

Winter semester — 3 lecs and 4 labs per week.

AS50: Dairy Production
Instructor: **Prof. Fredeen**
Prerequisite: 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
Instructor: **To be announced.**
Prerequisite: B20, AS34
Deals with the objectives and methods of producing beef cattle, sheep, and wool, 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 and flocks as well as use of the college animals.

Winter semester — 3 lecs and 2 labs per week.

AS52: Swine Production
Instructor: **Prof. Anderson**
Prerequisites: 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 — Krider, Conrad, and Carroll, *Swine Production.*

AS53: Poultry Production
Instructor: **Prof. Crober**
Prerequisites: B20, AS34
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.

AS54: Horse Management
Instructor: **Prof. Lirette**
Prerequisites: B20, AS34
Includes both the theoretical and practical aspects of horse care. Lectures cover history, local industry, breeds and selection, nutrition, reproduction, health, and management. Laboratory work emphasizes the practical aspects of the lecture material.

Fall semester — 2 lecs and 2 labs per week.

AS55: Fur Production
Coordinator: **Prof. Tennessen**
Prerequisites: B20, AS34
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.

AS58: Service Laboratory Procedures III
Instructor: **N.S. Vet. Lab. Pathology Staff**
Prerequisites: AS38, AS85
Corequisite: AS59
A continuation of Service Laboratory Procedures II with emphasis on improved performance under minimal supervision.

Winter semester — 1 lec and 1 lab per week.

AS59: Veterinary Laboratory Techniques III
Coordinator: **Prof. Ramsay**
Prerequisites: AS49, AS85
Corequisite: AS58
This course provides the opportunity for final retirement 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 — 1 lec and 3 labs per week.

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**
The student will be introduced to the basic procedures involved in operating an animal care centre. These procedures will include: recording animal records, procurement of feeds and supplies, monitoring animal health, scheduling work routines, maintaining special animal strains, and adjusting environmental conditions. Regular practice in the duties will be gained through contact instruction at the NSAC lab animal care centre.

Winter semester — 4 labs per week.

AS75: Animal Nursing and Clinical Procedures III
Instructor: **To be announced.**
Prerequisite: AS85
Corequisite: AS58
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 compentence in all pertinent skills.

Winter semester — 3 lecs and 4 labs per week.

AS85: Animal Health Practicum
Prerequisites: Successful completion of all courses in Year 2 of the AHT program or by special permission of the Animal Science Department Head.
This course is composed of a number of learning experiences at arranged locations off-campus. Included as typical sites are the Atlantic Veterinary College, private veterinary practices, and research institutions. It is during these externship periods that students are expected to become proficient in the skills required upon graduation. Log books and manuals of performance are maintained to track student progress. Faculty from NSAC maintain contact with preceptor institutions and the student to monitor the practicum experience. In general terms, upon completion of this course the student is expected to be able to perform the majority of the AHT functions near the level of performance required of the graduate.

Approximately seven months duration between May and December.

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
Instructor: **To be announced.**
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 to allow the student to demonstrate skills, planning ability, and the attention to detail required in scientific 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 publication. 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.

Animal Science

AS100: Introductory Animal Science (A)
Instructor: **Profs. Firth and Crober**
An introduction to the principles of animal science and commercial animal agriculture. A description of the nature and scale of animal production within the region and beyond is followed by an examination of the relevance of such basic areas of animal biology as physiology, genetics, and nutrition to commercial objectives and practices. Laboratory exercises provide an introduction to the operation and management of the range of animal industries in the region and to selected areas of commercial application of animal science technology.

Winter semester — 3 lecs and 2 labs per week.

AS201: Ruminant Animal Production (A)
Instructor: **To be announced.**
Prerequisite: AS100
A study of the principles and systems of efficient production from ruminant species, with emphasis on dairy, beef, and sheep. This is not a credit course for students majoring in Animal Science. This course is offered in alternate years.

Fall semester — 3 lecs and 2 labs per week.

AS203: Non-Ruminant Animal Production (A)
Instructor: **Prof. Lirette**
Prerequisite: AS100
A study of the principles and systems of efficient production from non-ruminant species, with emphasis on swine, poultry, and horses. This is not a credit course for students majoring in Animal Science. This course is offered in alternate years.

Fall semester — 3 lecs and 2 labs per week.

AS300: Animal Physiology (A)
Instructor: **To be announced.**
Prerequisites: AS100, B110
Preparatory: CS205
The systems within the animal body and changes occurring during its activities 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 — Lloyd, MacDonald, Crampton, *Fundamentals of Nutrition.*

AS310: Animal Breeding (A)
Instructor: **Prof. Patterson**
Prerequisites: B245, MP200
Deals with variation in animal performance and with the means whereby transmissible superiority may be recognized and put to use in achieving genetic improvement. Goals in improvement are discussed for each farm species, and programs employed are studied in each case.

Fall semester — 3 lecs and 2 labs per week.

AS315: Reproductive Physiology (A)
Instructor: **To be announced.**
Prerequisite: AS300
A study of the physiology of reproductive processes in animals and birds. Areas discussed include gamete production, reproduction cycles, control mechanisms, artificial insemination, modification of reproductive efficiency, embryo transfer, and subfertility.

Winter semester — 3 lecs and 2 labs per week.

AS320: Animal Health (A)
Instructor: **To be announced.**
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.

Animal Science

AS325: Applied Animal Nutrition (A)
Instructor: **Profs. 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.

AS340: Animal Behavior (A)
Instructor: **Prof. Tennessen**
Corequisite: AS300
A study of the behavior of farm animals, including poultry. Topics covered include domestication, learning and conditioned response, animal communication, agonistic and social behavior, reproductive and maternal behavior, behavior modification, development of behavior, genetics of behavior, the influence of management systems and practices on behavioral characteristics, and the relationship between behavior and performance.

Fall semester — 3 lecs and 2 labs per week.

AS345: Eggs and Dairy Products (A)
Instructor: **Prof. Firth**
Prerequisites: AS100, B225, CS200
The nature and composition of eggs, milk, butter, and cheese. Their processing, hygiene, grading, storage, and nutritional value, and how these are affected by production practices.

Fall semester — 2 lecs and 2 labs per week.

AS350: Meat Science (A)
Instructor: **Prof. Firth**
Prerequisites: AS100, CS200, B225
Deals with the preparation of red meat and poultry carcasses and with the proportionate and quality aspects of their component tissues. There is discussion of methods of carcass appraisal and grading in the different species, of the effects of storage, freezing, chilling, transportation, cutting, and processing, and of consumer acceptance and pricing.

Winter semester — 2 lecs and 2 labs per week.

AS360: Avian Biology (A)
Instructor: **Prof. Crober**
Prerequisites: AS100, CS200, B200, B240
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 will be examined.

Fall semester — 3 lecs and 2 labs per week.

AS450: Project-Seminar (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 area. This area is investigated and reported orally and in a scientific paper. Other areas of current interest are also presented and discussed in the weekly seminar period. The subject is credited in the winter semester but will commence with the fall semester.

Both semesters — 2 labs per week.

Animal Science

Animal Science Courses (AS400 to AS430, inclusive)
Application of the science of genetics, physiology, nutrition, and behavior 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

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 — Pond and Maner, *Swine Production in Temperate and Tropical Environments.*

AS410: Horse Management (A)
Instructor: **Prof. Lirette**
Fall semester — 2 lecs and 2 labs per week.

Text — Evans, Borton, Hintz, Van Vleck, *The Horse.*

AS415: Beef Production (A)
Instructor: **Prof. Lirette**
Winter semester — 2 lecs and 3 labs per week.

AS420: Sheep Production (A)
Instructor: **To be announced.**
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. Tennessen**
Winter semester — 2 lecs and 2 labs per week.

Description of Courses

Biology

B01: Pre-Tech Biology
Instructors: **Prof. Gray and Mr. Fergus**
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. Eaton**
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: **To be announced.**
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.

Biology

B40: Plant Pathology
Instructor: **Prof. McFadden**
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, behavior, 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.

Winter semester — 3 lecs and 3 labs per week.

B48: Plant Tissue Culture
Instructor: **Prof. Olson**
This subject 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.

B51: Hematology
Instructor: **To be announced.**
A study of blood structure and blood types for domestic animals is given. Procedures covered in laboratory exercise include blood smear preparation, staining, evaluation, routine hematological parameters, and blood storage.

Winter semester — 1 lec and 2 labs per week.

B55: Food Microbiology
Instructor: **To be announced.**
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. First offered in 1991-92.

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.

B72: Parasitology
Instructor: **To be announced.**
A study of morphology, anatomy, life cycles and classifications of external and internal parasites of vertebrate animals. The laboratory portion of the course includes techniques for sample collection, identification, and handling of parasites.

Winter semester — 2 lecs and 2 labs per week.

Biology

B75: Biological Photography
Instructors: **Prof. Le Blanc and Mr. Adams**
This subject has limited enrollment.
A practical introduction to the production of publication-grade still photographs comprised of the necessary elements for high-quality illustration of 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.

B100: Botany (S)
Instructor: **Prof. McFadden**
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, genetics and 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 eukaryotic cell, cell growth, the prokaryotic cell, and cell movement. In addition, 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: **To be announced.**
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.

B245: Genetics II (A)
Instructor: **To be announced.**
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 nemotode isolation, identification, and inoculation.

Fall semester — 3 lecs and 3 labs per week.

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 electromicroscopy.

Winter semester — 3 lecs and 3 labs per week.

B310: Mycology (S)
Instructor: **Prof. Sampson**
Prerequisite: B100
An introductory course dealing with the morphology, taxonomy, ecology, and physiology of the members of the kingdom Fungi, with special emphasis on important plant parasites.

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 behavior, 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* (5th 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. Olson**
Prerequisites: 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 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.

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 3 labs per week.

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 pesticide safety and toxicology.

Winter semester — 3 lecs and 3 discussion periods per week.

B449: Project-Seminar I (A)
Instructor: **Biology Department Faculty**
Coordinator: **Prof. Gray**
A course designed to introduce students in the Plant Protection option to independent research, including data acquisition, analysis, and presentation (written and oral). The research project and faculty advisor are to be chosen, in consultation with the course coordinator, during Semester VI. Other written and seminar topics will be assigned. This course is intended for students in the final year of the option.

Fall semester — 2 lecs and 4 labs per week.

B450: Project-Seminar II (A)
Instructor: **Biology Department Faculty**
Coordinator: **Prof. Gray**
Prerequisite: B449
A continuation of B449. Students will continue with their projects and will present a final written report, as well as a conference-style seminar. Other seminar topics and written assignments may be given.

Winter semester — 2 lecs and 4 labs per week.

Chemistry-Soils

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* (5th 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; 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, Man, and Society* (4th edition).

Chemistry-Soils

CS15: Microcomputer Applications
Instructor: **To be announced.**
This is a practical applications course which includes typing skills, word processing, and use of a database and spreadsheet. This is a required course for all students. Students who have already achieved competence in the use of microcomputers may challenge for credit.

Fall semester — 4 labs per week.

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, percentages, concentration of solutions, dilutions, stoichiometry, pH, weak acids and bases, buffers, recovery experiments.

Fall semester — 3 lecs per week.

CS40: Food Laboratory Methods
Instructor: **To be announced.**
A laboratory course which includes basic theory and techniques used to carry out testing methods used in the food processing industry.

Winter semester — 4 labs per week. First offered in 1991-92.

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 — Baum, *Introduction to Organic and Biological Chemistry* (4th edition).

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 — Baum, *Introduction to Organic and Biological Chemistry* (4th edition).

CS45: Qualitative Analysis
Instructor: **Prof. Hawley**
Semi-microanalysis is used to evaluate the qualitative nature of inorganic and organic agricultural materials. Theory includes separations and reactions of Groups I-V cations and anions, solutions, equilibria, Law of Mass Action, solubility products, hydrolysis, common ion effect, electrolytes, electrolysis, redox reactions, complex ions, oxidation potentials, pH indicators, and buffers.

Fall semester — 3 lecs and 4 labs per week.

Text — Layde and Busch, *Introduction to Qualitative Analysis.*

CS50: Introduction to Physical Chemistry
Instructor: **Prof. Hoyle**
Prerequisites: CS100, MP100
An introductory course which 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.

Fall semester — 3 lecs and 4 labs per week.

Text — Chang, *Physical Chemistry with Applications to Biological Systems* (2nd edition).

CS55: Food Packaging and Consumer Acceptability
Instructor: **To be announced.**
The students will learn the parameters of the regulations and the enforcement agencies the agri-food products industry works within, as well as the application of these regulations as they relate to packaging and consumer protection. Students will gain knowledge of opportunities and challenges that processing and packaging technology create and how that specifically relates to consumer acceptance of the end product. The second major component of the course is identifying and understanding the consumer, consumer trends, sensory and other feedback procedures used to determine consumer acceptance of the product and the package. The students will also look at food issues and how they affect purchasing trends (current and future).

Winter semester — 3 lecs and 2 labs per week. First offered in 1992-93.

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, extraction, digestion, colorimetry, and TLC.

Fall semester — 3 lecs and 4 labs per week.

Texts — Shuger et al., *Chemical Technicians Ready Reference Handbook;* American Chemical Society, *Safety in Academic Chemistry Laboratories* (4th edition).

CS69: Introductory Instrumentation
Instructor: **To be announced.**
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: **To be announced.**
Intended to familiarize students with the design, planning, organization, and operation of modern chemistry laboratories. Recording and keeping records and reports of analytical results are also studied. Specifically arranged for Chemistry Laboratory Technology students, the course emphasizes the understanding of all phases of laboratory operation, with special reference to a technologist's area of participation in it.

Winter semester — 2 lecs and 4 labs per week.

CS75: Basic Food Chemistry
Instructor: **Prof. Robinson**
Prerequisites: CS42, CS43, CS45
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: **To be announced.**
During Semester V of the Food Laboratory Technology program, each student will be required to work under contract in the food processing industry with an approved employer for a five-month period. This Food Laboratory Practicum is designed to provide the student with the instruction and "hands-on" experience relating to the application of food processing equipment and procedures. It will also provide the student with an opportunity to gain valuable work experience in an industrial setting. Prospective employers of Food Laboratory Technology students during the Practicum could include dairies, wineries, breweries, product development and quality control laboratories, as well as firms involved in the processing of meat, fish, vegetables, fruits, cereals, animal feeds, or similar products. The practicum will normally commence during the summer and continue into the fall semester.

Summer and Fall semesters — 5 months. First offered in 1992.

Chemistry-Soils

CS100: Chemical Principles I (S)
Instructor: **Prof. MacConnell**
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* (2nd edition)

CS110: Organic Chemistry I (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 — 3 lecs and 4 labs per week.

Text — Vollhardt, *Organic Chemistry*

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 — Lehninger, *Principles of 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 — Lehninger, *Principles of Biochemistry*

CS210: Chemical Principles II (S)
Instructor: **Prof. MacConnell**
Prerequisite: CS100
This course is a continuation of CS100 and includes a study of gases, liquids, and solids; interaction of electromagnetic energy and matter; reaction rates; electrochemistry; descriptive chemistry of selected metals and non-metals; and coordination compounds. The laboratory portion of the course will consist of qualitative analysis.

Fall semester — 3 lecs and 4 labs per week.

Text — McQuarrie and Rock, *General Chemistry* (2nd edition); Suehla, *Vogel's Qualitative Inorganic Analysis* (6th edition).

CS215: Organic Chemistry II (S)
Instructor: **Prof. Hoyle**
Prerequisite: CS110
This course is a continuation of CS110 and includes a study of reaction mechanisms, aromatic and heterocyclic compounds, polymers and modern synthetic methods.

Fall semester — 3 lecs and 4 labs per week.

Text — Vollhardt, *Organic Chemistry*

CS220: Introduction to Soil Science (A)
Instructor: **Prof. Warman**
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 — Brady, *The Nature and Properties of Soils* (9th 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 — Skoog and West, *Fundamentals for Analytical Chemistry* (4th edition).

Chemistry-Soils

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.

CS300: Physical Chemistry I (S)
Instructor: **Prof. Hoyle**
Prerequisites: CS210, MP235
A study of introductory topics in physical chemistry, including chemical kinetics and equilibrium, classical and statistical thermodynamics, the states of matter, physical aspects of electrochemistry, and photochemistry.

Fall semester — 3 lecs and 4 labs per week.

Text — Atkins, *Physical Chemistry* (3rd edition).

CS305: Instrumental Analytical Chemistry I (S)
Instructor: **To be announced.**
Prerequisites: 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.

Text — Skoog, *Principles of Instrumental Analysis.*

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.*

CS315: Instrumental Analytical Chemistry II (S)
Instructor: **To be announced.**
Prerequisites: CS225 and either CS110 or CS42
A continuation of Instrumental Analytical Chemistry I.

Winter semester — 3 lecs and 4 labs per week.

Text — Skoog, *Principles of Instrumental Analysis.*

CS320: Soil Fertility (A)
Instructor: **Prof. Warman**
Prerequisite: CS220
Preparatory: B260
Includes essential plant nutrients in the soil, influence of chemical and physical properties of soil 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.

CS325: Soil Genesis and Classification (A)
Instructor: **Prof. Brewster**
Coordinator: **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.

CS335: Soil Physics (A)
Instructor: **Prof. Miller**
Prerequisites: CS220 and MP105
Corequisite: MP220 or MP221
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 1991-92.

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.

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: CS205, AS300
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 hypothalmus, hypophysis, and adrenals.

Winter semester — 3 lecs per week.

Text — Smith et al., *Principles of Biochemistry: Mammalian Biochemistry,* 7th edition.

CS400: Physical Chemistry II (S)
Instructor: **Prof. Hoyle**
Prerequisites: CS300, MP235
A study of modern aspects of physical chemistry including diffraction methods, group theory and the application of quantum theory to spectra, and atomic and molecular structure. In addition, the use of computers in physical chemistry will be investigated.

Winter semester — 3 lecs and 4 labs per week.

Text — Atkins, *Physical Chemistry* (3rd edition).

CS410: Industrial Processing of Agricultural Products (A)
Instructors: **Chemistry-Soils Staff**
Prerequisite: CS200
A study of the chemistry and technology involved in fermentation, processing meat products, dairy products, cereal products, fats and oils, starch, fruit and vegetable products, biomass, and utilization of agricultural wastes. The laboratory part of the course will include visits to various industrial plants that process agricultural products.

Fall semester — 3 lecs and 4 labs per week. Next offered in 1991-92.

CS415: Special Topics in Chemistry and Soils (A)
Instructors: **Chemistry-Soils Staff**
An optional course for Agricultural Chemistry-Soil students who want to study a special topic in their final year. Course material will be arranged with Chemistry-Soils faculty. The course will be conducted by special tutorials and assigned readings.

Fall or winter semester — as arranged.

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.

CS449: Project-Seminar I (A)
Coordinator: **Prof. Brewster**
A required course for all Agricultural Chemistry-Soils 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 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. Brewster**
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.

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. During each segment, on-campus instruction is supplemented by visits to farms and farm-related businesses.

Winter semester — 2 lecs and 4 labs per week.

EB10: Accounting
Instructor: **Prof. Arnfast**
An introduction to accounting topics useful to managers. Topics discussed include forms of business organization, cash and accrued basis of accounting, financial statements, internal control, payrolls, bank reconciliation, types of accounting systems with emphasis on microcomputer applications.

Fall semester — 3 lecs per week.

Text — Meigs et al., *Accounting: The Basis for Business Decisions.*

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, preparation of financial statements. Considerable time will be spent on some applications of Canadian income tax.

Winter semester — 3 lecs and 2 labs per week.

EB12: Macroeconomics
Instructor: **Prof. Tait**
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.

Text — Lyons, *Canadian Macroeconomics.*

Economics and Business

EB13: Microeconomics
Instructor: **To be announced.**
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.

EB40: Marketing Practices
Instructor: **To be announced.**
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 behavior, supplier behavior, market structures, price determination, marketing boards, and marketing commissions. Students visit a series of firms and organizations involved in marketing farm products. Managers of these organizations assist with the instruction.

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. Major topics discussed and studied are: types of business organizations, legal structure in Canada, criminal and civil law, contracts, mortgages, liens, insurance, and marketing boards. Emphasis is placed on relating these topics to farm and farm-related business.

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, doing 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.

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:
- a detailed inventory of land, buildings, machinery, and all other farm resources. An analysis of the present farm operation;
- an outline of the student's objectives and projected plans for the farm;
- 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 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.

EB110: Agricultural Economics (A or E)
Instructor: **Prof. Grant**
This course is designed to introduce the students to the economic analysis of agriculture. Selected principles of economics are developed with an emphasis on microeconomic analysis.

Winter semester — 3 lecs per week.

Economics and Business

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: review of 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. Project work with farm and farm-related business records is included in the course to help students acquire a working knowledge of these principles and procedures.

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.

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: **To be announced.**
Prerequisite: EB210
An introductory course in cost accounting principles, techniques, and procedures. Topics necessary for management planning and control are examined. An attempt is made to relate these topics to farm business situations.

Fall semester — 3 lecs and 1 lab 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 to agricultural commodities, applications of price theory, and discussion of pricing institutions in the agricultural industry.

Winter semester — 3 lecs and 2 labs per week.

EB335: Business Marketing (E)
Instructor: **To be announced.**
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. Bowker**
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 system overview, national income analysis, monetary policy, and fiscal policy.

Winter semester — 3 lecs per week.

EB360: Econometrics (E)
Instructor: **Prof. Bowker**
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. Bowker**
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.

EB405: Macroeconomics II (E)
Instructor: **Prof. Grant**
Prerequisite: EB355
Development of the integrated aggregate model of the Canadian economy, which includes consideration of money, product, and labor markets, and aggregate demand and supply.

Winter semester — 3 lecs per week.

EB415: Business Law (E)
Instructor: **Prof. Lederman**
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. Bowker**
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 Seminar (E)
Instructor: **Prof. Grant**
Prerequisites: EB325, EB360
Designed to evaluate specific methods used by agricultural economics researchers. Selected papers which address issues examined by the discipline are used. Students are expected to critically evaluate the methods and conclusions presented. Preparation of a research proposal and seminar on the topic area is also required.

Fall semester — 2 lecs and 2 labs per week.

EB440: Farm Management II (A)
Instructor: **To be announced.**
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.

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 data sheet, 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.

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.

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
Instructor: **Prof Sanger**
The course is divided into three parts. The first examines library use, with emphasis upon retrieval systems specific to agriculture. The second provides instruction in the writing of scientific reports. The subject of the third is writing business letters. Student must also write a major essay, involving library research, on an assigned topic.

Fall semester — 3 lecs per week.

H120: Sociology I (H)
Instructor: **Prof. MacEachern**
Through assigned readings from the text and in lectures, students are challenged to examine the question of the extent to which the person is predetermined and/or predefined by one's society. In this way, insight is provided into basic sociological concepts. The first part of the course focuses on the individual and the socialization process. The second part deals with concepts used to analyze the social organization of society. The third part centers on concepts related to social change. An in-depth study is made of society from a sociological base with the examination of a contemporary book.

Fall semester — 3 lecs per week.

Texts — Landis, *Sociology, Concepts and Characteristics;*
Harris, *Cows, Pigs, Wars and Witches: The Riddles of Culture;*
Klagsburn, *Too Young to Die.*

H125: Sociology II (H)
Instructor: **Prof. MacEachern**
An examination of society with an emphasis on the person in community. Special attention is given to an understanding of the self and others, and to the question of death and dying.

Winter semester — 3 lecs per week.

Texts — Buscaglia, *Personhood;*
Harris and Harris, *Staying O.K.* ;
James & Jongeward, *Born to Win.*

H140: Personnel Management (H)
Instructor: **To be announced.**
Introduces students to the basic concepts needed to understand the behavior of people at work. Included are topics associated with motivation, communication, and group relationships. Emphasis is placed on how students, as potential supervisors, may apply behavioral concepts in the workplace and thereby contribute to improved employee performance. Students also examine the features of supervisory styles, elements of job design, effective introduction of change, and overcoming barriers to communication. Besides the lectures, films, and assigned readings, case studies are made by students on an individual and group basis. Case studies enable students to develop their decision-making abilities and to experience group dynamics.

Both semesters — 3 lecs per week.

Text — Kossen, *The Human Side of Organizations.*

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 Altantic agriculture and 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 Literature (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 twentieth-century Canadian novels. Books by Callaghan, MacLennan, Ringuet, Aguin, O'Hagan, Atwood, and Buckler have been used. Students must write a major term paper.

Winter semester — 3 lecs per week.

H220: Introductory French (H)
Instructor: **To be announced.**
Prerequisite: Two years of high school French
Designed to develop the student's use of French in the four language skills of listening, speaking, reading, and writing. A basic text and a workbook are used as well as various supplementary materials, such as French films, newspapers, additional texts, recordings of speeches by public figures, and learning kits. Students also are assigned individual projects. A number of hour-long evaluations are given and the average of these is used to arrive at a summative mark.

Winter semester — 3 lecs per week.

Text — Valette and Valette, *Contacts, Langue et Culture Francaise.*

H300: History of Agriculture (H)
Instructor: **Prof. Sanger**
Objective of this course is to examine the development of agriculture from the seventeenth to the mid-twentieth centuries. Particular emphasis is placed upon North American changes. Students are encouraged to carry out local historical field work. The course 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, at times decided by the instructor and student.

H305: Nature and Rural Life (H)
Instructor: **Prof. Sanger**
The objective of this course is to examine work by some of the naturalists and writers on farming and country life during the last two hundred years. Among those who may be studied are Gilbert White, John Young ("Agricola"), Cobbett, Audubon, Thoreau, Darwin, W.H. Hudson, and Richard Jefferies. Modern writers such as Wendell Berry, Loren Eiseley, and Franklin Russell will also be discussed.
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**
Prerequisites: Twenty 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 which 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**
Prerequisites: Twenty degree subjects including H100, 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, 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.

H340: Introduction to International Agriculture (A)
Coordinator: **International Agriculture Course Committee**
Prerequisites: PS100, AS100, EB110
Corequisite: CS220
An interdisciplinary lecture course on selected topics on international agriculture including: tropical animal production; crop production; economics and marketing problems in developing countries; engineering concerns in tropical countries, such as land and water use, mechanization issues, and storage problems; aspects of extension education. Lecturers are drawn from various College Departments and from the N.S. Department of Agriculture and Marketing.

Fall semester — 3 lecs per week.

H400: Issues in Agriculture (H)
Coordinators: **Prof. Tennessen, Animal Science, Prof. Warman, Chemistry-Soils**
Prerequisites: 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.

Description of Courses

Mathematics and Physics

MP01: Pre-Tech Mathematics
Instructor: **To be announced.**
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 throughout the course.

Winter semester — 2 lecs and 2 labs per week.

MP14: Computational Methods
Instructor: **Prof. Madigan**
A course to develop problem-solving and decision-making abilities and computational skills, both manual and machine. The course is based around the computer; mini- and microcomputer use in decision-making and computations is stressed. The problems are of a scientific and managerial nature, emphasizing agricultural applications. Some use of statistics is also included. The arithmatic 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.

Text — Betts, *Elements of Applied Physics*

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.

Mathematics and Physics

MP80: Transition Mathematics
Instructor: **To be announced.**
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.

Fall semester — 4 lecs per week.

MP90: Introductory Physics
Instructor: **To be announced.**
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.

Winter semester — 3 lecs and 4 labs per week.

MP100: Calculus and Analytic Geometry I (M)
Instructors: **Profs. I. Fraser and Madigan**
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 must take MP80.

Both semesters — 4 lecs per week.

Text — Munem and Foulis, *Calculus.*

MP105: Calculus and Analytic Geometry II (M)
Instructors: **Profs. I. Fraser and Madigan**
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 — Munem and Foulis, *Calculus.*

MP110: Physics (S)
Instructor: **Prof. S. Smith**
Prerequisite: University Preparation Grade XII Physics (N.S. 441, N.B 121 or 122) or NSAC MP090.
A treatment of the conceptual foundations of physical quantities, including kinematics, Newton's Laws, momentum, energy, and the conservation principles. The behavior of fluids, heat, and thermal transport are also studied.

Fall semester — 3 lecs and 4 labs per week.

Text — McCliment, *Physics.*

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 MP090.
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. Elementary optics and optical instruments are treated, with application to biological research.

Fall semester — 3 lecs and 4 labs per week.

Text — McCliment, *Physics.*

MP135: Physics for Life Sciences II (S)
Instructor: **Prof. S. Smith**
Prerequisite: MP130, MP110
A continuation of Physics MP130. The electric charge and 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 — McCliment, *Physics.*

MP200: Statistics (M)
Instructor: **Prof. Pearson**
Descriptive statistics; frequency distributions; probability; normal, standard normal, binomial, and chi-square distributions; tests of significance; t and F distributions, simple linear regression, and correlation; sampling; planning of experiments; analysis of variance of simple designs; non-parametric tests.

Winter semester — 3 lecs and 1 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. This is not a credit course for students who have a credit for MP221.

Fall semester — 3 lecs and 2 labs per week.

MP221: Computer Science (M)
Instructor: **Prof. Farmer**
Introduction to problem-solving methods and algorithm development. Emphasis is on designing, coding, debugging, and documenting programs, using BASIC. This is not a credit course for students who have a credit for MP220.

Winter semester — 3 lecs and 2 labs per week.

MP230: Multivariable Calculus (M)
Instructor: **Prof. Madigan**
Prerequisites: MP100, MP105
Covers vectors, differential calculus of several variables, multiple integration.

Fall semester — 4 lecs and 2 labs per week.

MP235: Differential Equations and Linear Algebra (M)
Instructor: **Prof. Madigan**
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 — Nilsson, *Electric Circuits.*

MP320: Statistical Methods (M)
Instructor: **Prof. Madigan**
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.

MP330: Agrometeorology (A)
Instructor: **Prof. S. Smith and Mr. Gordon**
Prerequisites: MP110 or 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, or insect pest levels.

Winter semester — 3 lecs and 2 labs per week.

Plant Science

PS10: Plant Production Practices
Instructor: **Prof. Haliburton**
This course introduces the student to agricultural practices utilized in the production of crop plants. Labs will give the student an opportunity to learn some of the skills and techniques involved in growing crops, both commercially and in research plots.

Fall semester — 3 lecs and 2 labs per week.

Text — Klein and Klein, *Fundamentals of Plant Science*

PS30: Agricultural Crops
Instructor: **Prof. Bubar**
Preparatory: PS10
Introductory crops course. Survey and classification of economic crops and factors that determine which crop alternatives are suited to the Atlantic Provinces. Pedigreed labs emphasize crop botany.

Winter semester — 3 lecs and 2 labs per week.

Text — Klein and Klein, *Fundamentals of Plant Science*

PS38: Nursery Crop Production
Instructor: **Prof. Mapplebeck**
Preparatory: PS10
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**
Preparatory: PS10
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: **To be announced.**
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: **To be announced.**
Prerequisite: PS40
A continuation of PS40 dealing with the establishment, production management, and harvesting and storage of forage and grain crops. 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.

PS43: Small Fruit Crops
Instructor: **Prof. Ju**
Berry crops studied include strawberries, raspberries, cranberries, blueberries, currants, gooseberries, and grapes. All aspects of berry production, from planting to marketing, are covered, as well as tree fruit production and harvesting. Course also includes visits to orchards and processing plants.

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, use of fertilizers, pruning, thinning, harvesting, 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. Haliburton**
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.

Plant Science

PS50: Landscape Horticulture I
Instructor: **Prof. Mapplebeck**
Fundamental principles and industry practices for the growth, selection, moving, and maintenance of trees, shrubs, and ground covers are discussed, as well as the functional uses of these ornamental plants for the contemporary landscape.

Fall semester — 3 lecs and 4 labs per week.

Text — Carpenter, Walker, Lanphear, *Plants in the Landscape.*

PS51: Residential Landscape Design and Construction
Instructor: **Prof. Higgins**
Prerequisites: AE12, PS50, PS60
Residential landscape design is studied in detail with special emphasis on a systematic approach to creative solutions in design problems. Landscapes of private homes and multiple-family complexes are studied.

Winter semester — 3 lecs and 4 labs per week.

Text — Hannebeum, *Landscape Design.*

PS53: Vegetable Production
Instructor: **Prof. Haliburton**
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, and *in vitro* techniques for micropropagation are also components of this course.

Fall semester — 3 lecs and 3 labs per week.

Text — Hartmann and Kester, *Plant Propagation.*

PS57: Landscape Maintenance
Instructor: **Prof. Mapplebeck**
Prerequisites: AE38, PS47, PS50
Deals with landscape maintenance. Emphasis is placed on scheduling horticultural work, horticultural maintenance equipment, and pesticides and their applications. Time studies and organization of horticultural tasks are considered. Seminars are important components of this course.

Winter semester — 3 lecs per week.

PS60: Landscape Plant Materials I
Instructors: **Profs. Higgins and Olson, and Ms. Darling**
Landscape plants are studied with respect to their identification, landscape value, hardiness, growth characteristics, diseases, and insects. Plants studied are deciduous trees, shrubs, vines, and annual bedding plants. Techniques for sketching plants will also be taught. The lab involves the study of plant families and their 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 Ms. Darling**
Landscape plant materials are studied with respect to their identification, landscape value, hardiness, growth characteristics, diseases, and insects. Plants studied are narrow- and broad-leafed evergreens and perennials. Foliage plants for interior plantscapes are also studied as well as techniques for sketching plants.

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. The work is begun in the Fall semester.

Fall semester — 2 lecs per week.
Winter semester — 2 lecs per week.

PS70: Landscape Techniques
Instructor: **Prof. Higgins**
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 6 weeks (240 hrs. minimum). Contract content will include such areas of work as landscape construction, landscape maintenance, plant production, sales, and will reflect the specialties of the employer.

Spring semester — 6 weeks.

PS71: Arboriculture
Instructor: **Prof. Higgins**
Prerequisite: PS50
Special emphasis is placed on advanced arboriculture, including environmental and non-parasitic injuries to trees, bracing and cabling, street trees, and evaluation of shade trees. Plant identification is an important part of this course.

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. Mapplebeck**
Prerequisites: PS47, PS71, PS73, AE38
Deals with landscape maintenance. Emphasis is placed on scheduling horticultural work, on horticultural maintenance equipment, and on pesticides and their applications. Time studies and organization of horticultural tasks are considered. A calendar of landscape maintenance tasks is developed by the student. Plant identification and seminars are important components of this course.

Winter semester — 3 lecs per week.

Text — Brown, *The Pruning of Trees, Shrubs and Vines.*

PS73: Landscape Horticulture II
Instructor: **Prof. Higgins**
Prerequisites: PS51, PS61
A study of herbaceous plants and their uses in the landscape. Other special groups of plants, such as vines, roses, and indoor landscaping plants, are studied. Special gardening techniques and styles will be examined.

Fall semester — 3 lecs per week.

Text — Buckley, *Canadian Garden Perennials.*

PS74: Landscape Design and Construction
Instructor: **Prof. Higgins**
Prerequisite: PS73
Advanced landscape design problems and techniques. Topics such as paving materials, site furniture, retaining walls, curbing, roof gardens, and planters are covered. A systematic approach to site planning, design, and construction of a design is thoroughly examined.

Winter semester — 3 lecs and 4 labs per week.

Text — Walker, *Site Design and Construction Detailing.*

PS76: Plant Products Physiology
Instructor: **Prof. Asiedu**
Prerequisite: B41 (can be taken concurrently)
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. Caldwell**
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.

Winter semester — Time to be announced.

PS100: Principles of Crop Production (A)
Instructor: **Prof. Bubar**
This is a prerequisite for all Plant Science production subjects. General principles underlying adaptation, improvement, culture, and utilization of agronomic and 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, Halfalre, and Parrish, *Plant Science.*

PS147: Farm Woodlot Management (A)
Instructor: **Prof. Robertson**
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: **To be announced.**
Prerequisites: PS100, B100
Preparatories: B260, B265
Study of principal underlying characteristics, tolerances, requirements, and uses of forage crops, and the production of forage plants for hay, pasture, silage, haylage, soilage, or cover.

Winter semester — 3 lecs and 2 labs per week.

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.

PS310: Vegetable Crops (A)
Instructor: **Prof. Haliburton**
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 1991-92.

Text — Peirce, *Vegetables — Characteristics, Production and Marketing.*

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 1991-92.

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.

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. Daniels**
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.

Winter semester — 3 lecs and 2 labs per week.

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.

PS340: Turfgrass Culture and Management (A)
Instructor: **Prof. Daniels**
Prerequisites: PS100, B100
Preparatories: B260, B265
Culture and management of turfgrass. Emphasis is on functional, recreational, and ornamental use of turf and on solving problems in turfgrass production. This course is offered in alternate years.

Fall semester — 3 lecs and 2 labs per week.

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.

Winter semester — 2 lecs and 4 labs per week. Next offered in 1991-92.

PS400: Plant Breeding (A)
Instructor: **Prof. Bubar**
Prerequisites: B240, MP200, one crop production subject
Corequisite: B245
Improvement of crops through the application of genetic principles to breeding methods. A term report is required.

Winter semester — 3 lecs per week.

PS405: Agronomy (A)
Instructors: **Prof. Bubar and Agronomy Staff**
Prerequisites: PS300, PS305, PS415, and PS449
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.

Description of Courses

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. Caldwell**
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 per week.

PS449: Plant Science Project-Seminar I (A)
Coordinator: **To be announced.**
A course involving preparation of a literature review and oral report on the topic written for PS450. 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 the final year of the Plant Science option as a prerequisite for PS450.

Fall semester — 1 lec per week.

PS450: Plant Science Project-Seminar II (A)
Coordinator: **To be announced.**
Prerequisite: PS449
Directed study of a topic that will involve research and require both an oral presentation and a written thesis.

Winter semester — 1 lec per week.

Graduate Courses

AS475 Ruminant Digestive Physiology and Metabolism (Also listed at Dalhousie University)
Instructors: **Profs. Fredeen and Lirette**
Prerequisites or Corequisites: 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.

B475: Agricultural Biology (Also listed at Dalhousie University)
Instructors: **NSAC Staff**
Coordinator: **Prof. Nowak**
This course is restricted to graduate students. The objective of this course is to familiarize students with contemporary issues in agricultural production and research and their relevance to biological sciences.
Equivalent to 5 hours per week. Timetable is arranged by course coordinator.

Winter semester.

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 embryogensis and organogensis, screening for pathogen and stress tolerance, and the application for these techniques in plant propagation, virus eradication, and 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.

Winter semester — 2 lecs and 4 labs per week.

Texts — Pierik, *In vitro Culture of Higher Plants;*
Dixon, *Plant Cell Culture, A Practical Approach.*

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) being studied. All vocational courses lead to vocational certificates.

The following courses are tentatively planned for the 1990-91 year:

- Accounting and Taxation (Farm)
- Blueberry Production and Marketing
- Christmas Tree Production (Basic)
- Dairy Herd Operation
- Draft Horses (Introduction to)
- Farm Skills I
- Farm Skills II
- Farrier (Basic)
- Floral Design
- Fox Production
- Grain Production
- Horse Care Program
- Ironwork
- Landscape Construction
- Meat Cutting
- Mink Production
- On-Farm Computers
- Pesticides — Crop Protection, Application, and Safety
- Preventive Maintenance and Repair of Farm Machinery
- Sheep Husbandry (Basic)
- Strawberry Production and Marketing
- Swine Farm Management
- Swine Herd Operation
- Tree Fruit Production and Marketing
- Turf Production
- Vegetable Production
- Welding (Basic Farm)
- Woodlot Management (Farm) and Chain Saw Safety

Entrance Requirements

These are specific for each course. In most cases, a candidate for admission must:

- be at least 17 years of age
- demonstrate interest in the occupation being studied
- have an opportunity for using information gained on the course in employment and/or be presently employed (or have experience) in work related to the course.

Cost

Room and board at the Nova Scotia Agricultural College is $110 per week. The cost for books, student fees, and other similar charges depends upon the length of the course and the topics being covered. Rarely do such costs exceed $50.

Vocational Courses

Living Allowances

Some adults on courses longer than two weeks may qualify for living assistance from the Canada Employment and Immigration Commission. The amount of the assistance is determined by the department according to the student's financial responsibilities.

Applications

Persons interested in any of the vocational courses should write a letter of application to the Coordinator of Vocational Courses, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia B2N 5E3.

Continuing Education

The NSAC offers evening courses, summer schools, and block programs from time to time for special interest groups within the agriculture and related industries. In recent years, night courses have been offered on Pet Care, Home Gardening, and Microcomputer Use.

In addition, home study courses were available on Sheep Production, Vegetable Production, and Chain Saw Use. Other courses are currently being developed.

For information on courses offered and costs, write Continuing Education, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia B2N 5E3. Telephone 895-1571, Local 300.

Scholarships and Bursaries

Entrance Scholarships

The 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 courses with averages of 80% or higher in the subjects required for admission. These scholarships are at two levels:

$1,500
Three scholarships of $1,500 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 course. Provided the recipients maintained the 80% level in the work of the previous year with no failed subjects, $1,500 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 $500.

$1,000
Scholarships of $1,000 each are offered to all students (except those selected for the $1,500 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, $1,000 is offered each year for the normal duration of the course. For those whose averages at NSAC drop below 80%, but remain above 75%, the amount of the annual scholarship will be $500.

The 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 $200 for all residents of Nova Scotia accepted for the technical courses with averages in the subjects for admission of 80% or higher.

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, $200 is offered for students admitted to the second and third years of their programs.

Newfoundland Dairy Marketing Board Scholarships
The Newfoundland Dairy 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.

The Woodside Memorial Scholarship
As a tribute to the memory of Harold & 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, 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.

Newfoundland Provincial Scholarships
The Newfoundland government, through its Department of Education, offers three scholarships of $700 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 course, 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 has provided a scholarship of $1,000 for a resident of Nova Scotia entering one of the degree courses at the Nova Scotia Agricultural College. In awarding this scholarship, the selection committee will take into consideration academic standing, participation in school and community activities, and financial need. Applicants should write the Registrar, Nova Scotia Institute of Agrologists, NSAC, Truro, Nova Scotia B2N 5E3, for an application form. The application and applicant's Grade XII certificate should be in the Registrar's Office not later than July 1.

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 course. Academic standing and financial need are taken into consideration in awarding the scholarships. No application is necessary.

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 courses at NSAC and who receives no other scholarship with a higher value. The selection of the recipient 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.

The selection of the recipient will be made by the Scholarship Committee of NSAC, and the presentation will be made at Autumn Assembly.

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 20.

Scholarships and Bursaries

The Benny Duivenvoorden Memorial Scholarship
The Benny Duivenvoorden Memorial Scholarship of $500 is offered by the New Brunswick Central Artificial Breeding Co-operative 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.

Co-op Atlantic Bursaries
Co-op Atlantic offers three bursaries of $500 each to students entering the technician course. Selection is based on the recommendation of a local co-operative or district Federation of Agriculture, on need, and on potential for community leadership and/or co-operative endeavor. 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

The 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 courses with averages in the work of the previous year at NSAC of 75% or higher.

$1,000 is awarded to all these students with averages in the work of the previous year of 80% or higher and with no failed subjects.

$500 is awarded to all these students with averages in the work of the previous year of 75% to 80% and with no failed subjects.

The Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Technical Programs
The Nova Scotia Department of Agriculture and Marketing offers scholarships of $200 to all NSAC students who are residents of Nova Scotia and who are admitted for their second or third year of the technical courses with averages in the work of the previous year at NSAC of 80% or higher and with no failed subjects.

The 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.) course. The student receiving this scholarship must have a farming background. In selecting the recipient, the Scholarships Committee of NSAC will take in 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 20.

Scholarships and Bursaries

The 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 course 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 20.

The 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 course 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 course and is entering the second year of that program. Financial need and academic standing are considered in making the award. No application is necessary.

The 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, 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.

The 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 course. Candidates are considered on the basis of (1) academic standing, (2) involvement and interest in poultry, and (3) achievement and contribution to 4-H.

The selection of the recipient is made on the recommendation of the Animal Science Department, and the scholarship is awarded at the Autumn Assembly.

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 20.

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 with 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.

The 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.

A.W. Mackenzie Memorial Scholarship
A scholarship of $150 is offered by A.W. Mackenzie for a student entering the second year of the degree course. 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 20.

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 20.

The 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 courses. Academic standing and financial need are taken into consideration in awarding this bursary. No application is necessary.

New Brunswick Poultry Council Scholarship
The New Brunswick Poultry Council offers an annual scholarship of $450 to a student of the Pre-Veterinary course at NSAC who is admitted to the Atlantic Veterinary College or other similar Canadian veterinary college.

The selection of the recipient of this award shall 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 shall be given to a student from New Brunswick.

The 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.

Donald E. Clark Memorial Scholarship
In memory of the late Professor and Head of the Agricultural Engineering Department,

Donald E. Clark, a scholarship(s) is(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.

The Wilfred Cyr Memorial Scholarship
The New Brunswick Sheep Breeders Association, in memory of the late Wilfred Cyr, offers two scholarships of $100 each (one to an anglophone and one to a francophone) to students from New Brunswick who have completed the first year of a degree or technical course 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 at the Registrar's Office is September 1.

The 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 course. It is awarded on the recommendation of the Economics and Business Department staff. The selection of the recipient is to be based on 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.

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.

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 and graduated from NSAC in 1911, an international wool merchant who, 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.

Scholarships and Bursaries

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.

Supersweet Feeds Scholarship
Supersweet Feeds (Newfoundland), 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.

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 Chairman of the NSAC Scholarship Committe before September 20.

Bruce Trenholm/Atlantic '88 Scholarship
Up to $500 will be awarded annually to a student, 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 decision on the awarding of the scholarship 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.

Scholarships for Third - and Fourth- Year Degree Students

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.) course 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.

The A.C. Neish Memorial Trust Scholarship
The A.C. Neish Memorial Trust awards a $1,200 scholarship to a student of the Nova Scotia Agricultural College who completes, in a satisfactory manner, the third year of study. The award is tenable at NSAC for a fourth year of study. The criteria for the selection of the recipient 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 at the Registrar's Office is February 1.

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 criteria for the selection of the recipient 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). Among the students with this qualifying average only minor emphasis will be placed on academic standing. (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. (5) Financial need where significant differences between candidates can be identified.

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.

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.

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 20.

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.

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 31.

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.

The 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 course. The scholarships are presented at Autumn Assembly. No application is required.

Canadian Feed Industry Association (Atlantic Division) Scholarship
The Atlantic Division of the Canadian Feed Industry Association offers a $400 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 at the Registrar's Office is September 20.

The 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.

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 20.

The 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.

University of Maine Scholarship
Under the agreement between the University of Maine at Orono and the Nova Scotia Agricultural College, up to five graduates each year from the two-year degree course in Agricultural Science 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.

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.

Bravo 500 Plant Protection Scholarship
Fermenta Plant Protection Company offers two scholarships of $1,250 each to students entering the 3rd or 4th 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 qualifed 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 Chairman of the NSAC Scholarship Committee before September 20.

Scholarships for B.Sc.(Agr.) Graduates

Nova Scotia Fur Institute Scholarship
Candidates must be graduates in Animal Science from the Nova Scotia Agricultural College and be accepted to do graduate studies in fur production at an approved university. 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 31st. Scholastic achievements will carry a heavy weighting in candidate selection.

Medals and Prizes

Governor-General's Medals
A gold 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 silver Governor-General's Medal is awarded annually to the student in the technical courses who achieves the highest academic standing in the graduating class.

Atlantic Provinces Swine Producers' Awards
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.

$300 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 endeavors, 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.

$450 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.

The 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.

The 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.

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.

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 Nova Scotia Agricultural 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.

Medals and Prizes

The Lorne C. Callbeck Prize
A prize of $50 is awarded each autumn from the estate of the late Mr. Lorne C. Callbeck to a second-year degree student who excelled in the Plant Science course in his or her first year.

The 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 course.

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.

Office of the Registrar
Nova Scotia Agricultural College
PO Box 550
Truro, Nova Scotia

B2N 5E3