



Your Future is Here

**Nova Scotia Agricultural College
Calendar 1991-1992**

Serving Atlantic Canada

Your Future is Here



Nova Scotia Agricultural College

Eighty-Sixth Annual **Calendar 1991-1992**

Mailing Address:

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



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Contents

Application for Admission	1
1991-92 Calendar	3
Academic Calendar 1991-92	4
Officers of Administration	5
Faculty	6
Schedule of Payments	11
Deposits	11
Payments at Registration	11
Degree Programs	12
Technician and Technology Programs	12
Individual Course Cost (Part-Time Students)	13
Residence Accommodations	13
Caution and Laboratory Deposit	14
Health Services	14
Financial Aid for Students	15
Canada Student Loans Plan	15
A.F.A.C. Student Exchange Assistance	15
Class of '44 Lectureship	15
The Donald E. Curren Scholarship	16
Scholarships	16
General Information	17
Programs Offered	17
Facilities	18
Post Office Address	18
Telephone	18
Banks and Credit Unions	18
Express and Freight	18
College Colors	19
Churches	19
Day Care	19
Student Services	19
Student Placement Service	19
Student Government	19
Student Activities	19
College Royal Winter Fair	19
Clubs and Committees	20
Social Activities	20
Athletics	20
Rules and Regulations	21
General Regulations	21
Residence Regulations	21
Use of Motor Vehicles	22
Medical	22
Athletic Regulations	22
Summary of Academic Programs	23
Agricultural Science	23
Agricultural Engineering	23
Engineering	23

Contents

Pre-Veterinary Medicine	23
Technician Courses	23
Technology Courses	23
Graduate Studies	24
Vocational Courses	24
Explanation of Terms and Codes	25
Category Codes — B.Sc. (Agr.) Program	26
Degree Programs	27
Academic Standing	28
Entrance Requirements	28
Supplemental Examinations	29
Challenge for Credit	29
Regulations	29
Bachelor of Science in Agriculture — B.Sc. (Agr.)	30
Minimum Requirements	31
Syllabus (Year 1)	31
Syllabus (Agricultural Chemistry)	32
Syllabus (Soil Science)	33
Syllabus (Agricultural Economics)	34
Syllabus (Agricultural Mechanization)	35
Syllabus (Animal Science)	36
Syllabus (Agribiology: Environmental Biology)	37
Syllabus (Plant Protection)	38
Syllabus (Plant Science)	39
Agricultural Engineering Diploma	40
Requirements	40
Engineering Diploma	40
Requirements	40
Syllabus (Agricultural Engineering Diploma)	41
Syllabus (Engineering Diploma)	42
Pre-Veterinary Medicine	43
Syllabus	43
Pre-Tech Semester	44
Technician Programs	45
Entrance Requirements	45
Academic Standing	45
Supplemental Examinations	45
Agricultural Colleges Exchange Program	46
Agricultural Business	46
Academic Entrance Requirements	46
Syllabus	47
Agricultural Engineering	49
Academic Entrance Requirements	49
Syllabus	49
Animal Science	50
Academic Entrance Requirements	50
Syllabus	50

Contents

Farm Equipment	52
Academic Entrance Requirements	52
Syllabus	52
Plant Science	53
Academic Entrance Requirements	53
Syllabus	53
Technology Programs for High School Graduates	55
Admission Requirements	55
Animal Health Technology	55
Academic Entrance Requirements	55
Syllabus	56
Biology Technology	57
Academic Entrance Requirements	57
Syllabus	58
Chemistry Laboratory Technology	59
Academic Entrance Requirements	59
Syllabus	59
Food Laboratory Technology	60
Academic Entrance Requirements	60
Syllabus	60
Landscape Horticulture Technology	61
Academic Entrance Requirements	61
Syllabus	61
Technology Programs for Technician Graduates	62
Agricultural Technology	62
Agricultural Engineering Technology	63
Syllabus	63
Farming Technology	64
Entrance Requirements	64
Syllabus	64
Description of Courses	66
Agricultural Engineering	66
Animal Science	78
Biology	90
Chemistry and Soil Science	99
Economics and Business	109
Humanities	116
Mathematics and Physics	121
Plant Science	126
Graduate Courses	136
Vocational Courses	137
Entrance Requirements	137
Cost	137
Living Allowances	138
Applications	138
Continuing Education	139

Contents

Scholarships and Bursaries	140
Entrance Scholarships	140
Continuation Scholarships	142
Scholarships for Third- and Fourth-Year Degree Students	147
Scholarships for B.Sc. (Agr.) Graduates	150
Medals and Prizes	151

Application for Admission Nova Scotia Agricultural College

P.O. Box 550
Truro, Nova Scotia
B2N 5E3
893-6722

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

APPLICATION PROCESSING FEE \$20.00

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)**
- | | | |
|--|--|--|
| <input type="checkbox"/> Degree [B.Sc.(Agr.)]
<input type="checkbox"/> Pre-Veterinary
<input type="checkbox"/> Agricultural Engineering [B.Sc.(Agr.Eng.)]
<input type="checkbox"/> Engineering [B.Sc.(Eng.)]
<input type="checkbox"/> Special (to take degree courses) | <input type="checkbox"/> Technician
<input type="checkbox"/> Agricultural Business
<input type="checkbox"/> Agricultural Engineering
<input type="checkbox"/> Animal Science
<input type="checkbox"/> Farm Equipment
<input type="checkbox"/> Plant Science
<input type="checkbox"/> Pre-Tech Semester (January)
<input type="checkbox"/> Special (to take Technical courses) | <input checked="" type="checkbox"/> Technology
<input type="checkbox"/> Agricultural
<input type="checkbox"/> Agricultural Engineering
<input type="checkbox"/> Animal Health
<input type="checkbox"/> Biology
<input type="checkbox"/> Chemistry Laboratory
<input type="checkbox"/> Farming
<input type="checkbox"/> Food Laboratory
<input type="checkbox"/> 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)

1991-1992 Calendar

1991

July 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			

August 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

September 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					

October 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		

November 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

December 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				

1992

January 1992						
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 1992						
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

March 1992						
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 1992						
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 1992						
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 1992						
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

1991-1992

1991

September 9	Registration for first-time students.
September 10	Registration for returning students.
September 11	Fall Semester classes begin.
October 14	Thanksgiving. No classes.
November 11	Observance of Remembrance Day. No classes.
December 6	Last day of classes, Fall Semester.
December 9-19	Fall Semester examinations.

1992

January 3	Registration for first-time students.
January 6	Winter Semester classes begin.
February 24-28	Mid-semester break for individual study.
April 3	Last day of classes, Winter Semester.
April 6-16	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. (Technical University of Nova Scotia), M.B.A.(Dalhousie)

Librarian

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

Reference Librarian

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

Dean of Student Services

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

Director of Athletics

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

Placement Officer

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

Business Manager

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

Secretary

Mrs. Ruby MacKay

Farm Manager

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

Information Officer

Vacant

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

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. (McGill)

Associate Professor

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

Associate Professor

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

Associate Professor

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

Assistant Professor

Animal Science

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

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

Professor Emeritus

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

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

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

Associate Professor

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

Associate Professor

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

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

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

Adjunct Professor

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

Faculty

W.G. Mathewson, B.Sc. (Aberdeen), M.Sc. (Aberdeen)

Professor Emeritus

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

Farm Manager

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

Associate Professor

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

Associate Professor

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

Adjunct Professor

T. Semple, D.V.M.

Sessional Lecturer

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

Associate Professor

Biology

L.J. Eaton, B.Sc. (Acadia), M.Sc. (Dalhousie), Ph.D. (Dalhousie)

Professor and Head

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

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)

Associate Professor

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

Principal and Professor

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

Professor

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

Associate Professor

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

Professor

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

Assistant Professor

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

Adjunct Professor

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

Professor

Faculty

Chemistry and Soil Science

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

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

Assistant Professor

J.E. Hawley, B.Sc. (Agr.)(McGill)

Assistant Professor

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

Associate Professor

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

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

Faculty

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

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

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)
Associate 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)
Professor and Head

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

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

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

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

Faculty

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

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

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

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)
Professor

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

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

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

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

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

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

R.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 by August 1 to the Registrar's Office a \$25 program 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 9. 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 30 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 approximately \$500 per academic year.

All payments are due on the dates stated.

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

Students who intend to finance their education with Canada Student Loan funds, but 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. The fees below may be used as a guide for financial planning for 1991-92. The fee schedule will be available early in 1991.

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

Fall Semester Payment

Tuition _____	\$	700
Accommodation and meals (double) _____	\$	1,625
Accommodation and meals (single) _____	\$	1,785
Caution and laboratory deposit _____	\$	55
Student Union _____	\$	60
Athletics _____	\$	45
Medical insurance _____	\$	15
Medical insurance (non-Canadian) _____	\$	500
Books (estimated) _____	\$	350

Winter Semester Payment

Tuition _____	\$	700
Accommodation and meals (double) _____	\$	1,735
Accommodation and meals (single) _____	\$	1,895
Books (estimated) _____	\$	350

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. The fees below may be used as a guide for financial planning for 1991-92. The fee schedule will be available early in 1991.

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

Fall Semester Payment

Tuition _____	\$	300
Accommodation and meals (double) _____	\$	1,625
Accommodation and meals (single) _____	\$	1,785
Caution and laboratory deposit _____	\$	55
Student Union _____	\$	60
Athletics _____	\$	45
Medical insurance _____	\$	15
Medical insurance (non-Canadian) _____	\$	500
Books (estimated) _____	\$	350

Schedule of Payments

Winter Semester Payment

Tuition _____	\$	300
Accommodation and meals (double) _____	\$	1,735
Accommodation and meals (single) _____	\$	1,895
Books (estimated) _____	\$	350

Individual Course Cost (Part-Time Students)

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

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 60% of the total room and board fee for the semester. 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.

Student 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 30. 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 2 for all new students,
- after dinner on September 3 for all other students.

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

Caution and Laboratory Deposit

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

Financial Aid for Students

The Donald E. Curren Scholarship

The scholarships (four of \$1,000 each, and four of \$500 each) are open to mobility impaired students who have been accepted by a university in the Atlantic Provinces, with preference to paraplegics and quadraplegics. The scholarships will be awarded on merit, and on such other criteria as the Selection Committee may determine. Recipients must be Canadian citizens or landed immigrants, and must be residents of the Atlantic Provinces.

Applicants must complete the application form for the scholarship and provide official transcripts from the most recent year of study. Application forms can be obtained by writing to the Donald E. Curren Scholarship Fund, c/o Canadian Paraplegic Association, Nova Scotia Division, 1310 Hollis Street, Suite 150, Halifax, Nova Scotia B3J 3P3. Application deadline is July 15.

Scholarships

Detailed information is given on pages 140-150.

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

Students who wish to take the two-year Pre-Veterinary program to meet the admission requirements of the Atlantic College of Veterinary Medicine at the University of Prince Edward Island will be counselled in their selection of courses regarding blending of the Pre-Vet program with the options of the B.Sc. (Agr.) program.

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

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

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

General Information

The various programs for the 1991-92 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 85 years is conclusive evidence that students obtain a sound agricultural education in the programs offered.

The College buildings — Cumming Hall, Harlow Institute, Banting Building, MacRae Library, Athletic Centre, Collins Horticultural Building, Cox Institute of Agricultural Technology with its recently opened extension, Boulden Building, Hancock Veterinary Building, 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.

Post Office Address

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

Telephone

Nova Scotia Agricultural College, Registrar's Office, (902) 893-6722

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 the Canadian National Railway.

General Information

College Colors

Royal Blue and Regular Gold

Churches

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

Day Care

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

Student Services

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

Student Placement Service

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

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

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

Student Government

Through a system of self-government, students are encouraged to accept the greatest possible 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.

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

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.

General Information

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

Social activities on the campus are supervised by a committee appointed by the Student Union. 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 Athletic Association 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.

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 Student Services.

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

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

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

Tampering with fire protection equipment is forbidden.

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

Every student is expected to show, both within and outside the College, such respect for order, morality, and the rights of others, and such sense of personal 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.

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

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

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

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

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 Student Services.

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

Use of Motor Vehicles

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

Medical

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

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

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

Athletic Regulations

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

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

A student wishing to participate in athletics other than those sponsored by the College must apply in writing to, and obtain permission from, the Principal before participating either as a player or 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 eight options: Animal Science, Agricultural Economics, Plant Protection, Plant Science, Agricultural Chemistry, Soil Science, Agricultural Mechanization, and Agribiology: Environmental Biology. 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 two-year program of study is offered for students who wish to attempt admission to the D.V.M. program at the University of Prince Edward Island. The same program of study can also serve as the first two years of the B.Sc. (Agr.) program (Animal Science option).

Technician 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, Biology Technology, and Food Laboratory are three-year programs. The Chemistry Laboratory Technology program 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 through the Office of Continuing Education.

Explanation of Terms and Codes

The courses listed in the syllabi and in the descriptions of courses beginning on page 66 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. B25 is a Biology subject offered in the first year, second semester of the Biology Technology 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 66:

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		

Degree Programs

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

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

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

Agricultural Engineering students who successfully complete the three years of the Agricultural Engineering degree program can proceed to Macdonald College of McGill University or to any of the other of the six institutions in Canada offering agricultural engineering for their final years of this professional degree. Engineering students who complete the required two-year program are admitted to the third year in the engineering discipline of their choice at the Technical University of Nova Scotia or may apply to any other institution offering engineering programs.

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

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

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

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

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

Degree Programs

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:

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

Those who, in the semester following, do not raise their cumulative grade averages (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 program leading to a B.Sc. (Agr.) and the Pre-Vet program must present high school graduation certificates showing an average of at least 60%, with no mark below 50%, in Grade XII (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 and the Engineering program must present high school graduation certificates showing an average of at least 60%, with no mark below 50%, in Grade XII (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.

Graduates of Newfoundland Grade XII will be considered for direct entry if their average is 60% or higher in University Preparatory English, Mathematics, Chemistry, Biology or Physics, and one other subject. The Grade XII level courses for Mathematics and English must be the third full year of high school study in these subjects, and for Chemistry and Biology or Physics the second full year.

Degree Programs

Supplemental Examinations

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

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

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

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

Challenge for Credit

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

Regulations

Application for Challenge for Credit is made to the Registrar.

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

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

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

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

Degree Programs

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

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

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

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

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

A total of only six credits may be accumulated by Challenge for Credit.

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

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

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

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

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

Degree Programs

Minimum Requirements

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

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

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

Syllabus

Year 1 – All Options

Semester I

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

Semester II

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

The first academic year 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 Chemistry

Semester III

CS200	Biochemistry I
CS210	Chemical Principles II or CS215 Organic Chemistry II ¹
CS220	Introduction to Soil Science
MP130	Physics for Life Sciences I <i>Elective</i> ²

Semester IV

CS205	Biochemistry II
CS225	Quantitative Analytical Chemistry
MP200	Statistics
MP222	Computer Methods <i>Elective</i> 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 <i>Elective</i> ²

Semester VI

B260	Plant Physiology
CS310	Radiotracers in Agriculture 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 <i>Elective</i> ² <i>Elective</i> 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 Studies

¹These courses will be taken in alternate years.

²Electives must include one course in Agricultural Science and one course in Humanities or Economics.

Degree Programs

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

Years 2, 3 and 4 – Soil Science

Semester III

CS200	Biochemistry I
CS210	Chemical Principles II
CS220	Introduction to Soil Science
MP130	Physics for Life Sciences I
MP220	Computer Science

Semester IV

B225	Microbiology
B260	Plant Physiology
CS225	Quantitative Analytical Chemistry
CS230	Introduction to Geology
MP200	Statistics

Semester V

B330	Ecology
CS305	Instrumental Analytical Chemistry I
CS325	Soil Genesis and Classification <i>Elective</i> ¹ <i>Elective</i> ¹

Semester VI

CS320	Soil Fertility
CS335	Soil Physics ² or CS340 Soil Chemistry ²
EB355	Macroeconomics I
H205	Canadian Studies <i>Elective</i> ¹

Semester VII

AE340	Soil and Water
B400	Soil Microbiology
CS430	Soil Survey and Land Evaluation
CS449	Project-Seminar I <i>Elective</i> ¹

Semester VIII

CS335	Soil Physics ² or CS340 Soil Chemistry ²
CS450	Project-Seminar II <i>Elective</i> ¹ <i>Elective</i> ¹ <i>Elective</i> 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.*

Degree Programs

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
	<i>Elective</i> ¹

Semester IV

EB205	Microeconomics II
EB215	Financial Accounting II
H205	Canadian Studies
MP200	Statistics
	<i>Elective</i> ¹

Semester V

EB310	Cost Accounting
EB335	Business Marketing
EB340	Farm Management I
EB360	Econometrics
	<i>Elective</i> ¹

Semester VI

EB325	Operations Research
EB330	Agricultural Markets and Prices
EB355	Macroeconomics I
MP222	Computer Methods
	<i>Elective</i> ¹

Semester VII

EB400	Resource and Environmental Economics
EB415	Business Law
EB425	Research Methods Seminar
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VIII

EB405	Macroeconomics II
EB420	Agricultural and Food Policy
EB440	Farm Management II
EB450	Project-Seminar
	<i>Elective</i> ¹

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

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 Studies
MP135	Physics for Life Sciences II
MP200	Statistics

Semester V

AE231	Agricultural Machinery
AE305	Engineering Measurements and Controls
EB340	Farm Management I
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VI

AE325	Agricultural Tractors
EB355	Macroeconomics I
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VII

AE340	Soil and Water
AE449	Project-Seminar I
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VIII

AE330	Hydrology
AE450	Project-Seminar II
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹

¹*Electives must include three Agricultural Engineering courses.*

Degree Programs

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
MP130	Physics for Life Sciences I

Semester IV

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

Semester V

AE150	Engineering in Agriculture
AS300	Animal Physiology
AS305	Animal Nutrition
AS310	Animal Breeding
	<i>Elective</i> ¹

Semester VI

AS315	Reproductive Physiology
AS320	Animal Health
AS325	Applied Animal Nutrition
EB355	Macroeconomics I
	<i>Elective</i> ¹

Semester VII

AS449	Project-Seminar I
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VIII

AS450	Project-Seminar II
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹
	<i>Elective</i> ¹

¹*Electives must include three Animal Production courses, and one Humanities or Economics course.*

Degree Programs

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

Years 2, 3 and 4 — Agribiology: Environmental Biology

Semester III

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

Semester IV

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

Semester V

AS300	Animal Physiology
B330	Ecology
B360	Environmental Analysis
B385	Principles of Pest Management <i>Elective</i> ¹

Semester VI

B350	Ecological Methods
B365	Environmental Impact
H205	Canadian Studies
MP222	Computer Methods <i>Elective</i> ¹

Semester VII

B240	Genetics I
B400	Soil Microbiology
B449	Project-Seminar I <i>Elective</i> ¹ <i>Elective</i> ¹

Semester VIII

B430	Ecology of Agriculture
B450	Project-Seminar II
EB355	Macroeconomics <i>Elective</i> ¹ <i>Elective</i> ¹

¹*Electives must include one of either H320 or H325, one additional Humanities or Economics course, two additional Agricultural Science courses, and one Agricultural Engineering course.*

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

Degree Programs

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

Years 2, 3 and 4 — Plant Protection

Semester III

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

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
	<i>Elective</i> ¹

Semester VI

B305	Economic Plant Pathology
B325	Economic Entomology
B345	Applied Weed Science
MP222	Computer Methods
	<i>Elective</i> ¹

Semester VII

B240	Genetics I
B330	Ecology
B449	Project-Seminar I
	<i>Elective</i> ¹
	<i>Elective</i> ¹

Semester VIII

B450	Project-Seminar II
EB355	Macroeconomics I
H205	Canadian Studies
	<i>Elective</i> ¹
	<i>Elective</i> ¹

¹*Electives must include one of either H320 or H325, one additional Humanities or Economics course, one of either B400 Soil Microbiology, B405 Pesticides in Agriculture, or B430 Ecology of Agriculture, and one Agricultural Engineering course.*

Recommended Electives:

MP320	Statistical Methods
MP330	Agrometeorology
PS350	Plant Biochemistry
	One crop production course.

Degree Programs

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
MP130	Physics for Life Sciences I

Semester IV

B260	Plant Physiology
H205	Canadian Studies
MP200	Statistics
	<i>Crop Production Elective</i>
	<i>Elective¹</i>

Semester V

B300	Principles of Plant Pathology
B320	General Entomology
B335	Weed Science
CS220	Introduction to Soil Science
	<i>Elective¹</i>

Semester VI

CS320	Soil Fertility
EB355	Macroeconomics I
	<i>Elective¹</i>
	<i>Elective¹</i>
	<i>Elective¹</i>

Semester VII

PS415	Crop Adaptation
PS449	Project-Seminar I
	<i>Elective¹</i>
	<i>Elective¹</i>
	<i>Elective¹</i>

Semester VIII

PS405	Agronomy or PS410 Horticulture
PS450	Project-Seminar II
	<i>Elective¹</i>
	<i>Elective¹</i>
	<i>Elective¹</i>

¹Electives 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	Computer Science or MP222 Computer Methods
MP330	Agrometeorology (Prerequisite: MP130)
PS400	Plant Breeding (Prerequisites: B240, MP200, one crop production course; corequisite: B245)

Degree Programs

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.

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.

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
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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
	<i>Humanities Elective Elective¹</i>

Semester VI

AE315	Strength of Materials
AE320	Agricultural Structures
AE350	Fluid Mechanics
	<i>Humanities Elective Elective¹</i>

¹One elective must be an Agricultural Engineering course.

Degree Programs

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 ¹
MP105	Calculus and Analytic Geometry II
MP135	Physics for Life Sciences II

Year 2

Semester III

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

Semester IV

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

¹May substitute H150 Agriculture Today, H140 Personnel Management, and H325 Technology in Agricultural Communications if timetable permits.

²May substitute H320 Extension Education in the Rural Community if timetable permits.

³May substitute H140 Personnel Management, H325 Technology in Agricultural Communications, or H125 Sociological Studies if timetable permits.

Degree Programs

Pre-Veterinary Medicine

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

Syllabus

Year 1

Semester I

B100 Botany
CS100 Chemical Principles I
H100 Technical Writing
MP100 Calculus and Analytic
Geometry I
*Elective*¹

Semester II

B110 Zoology
CS110 Organic Chemistry I
EB110 Agricultural Economics¹
*Elective*¹
*Elective*¹

Year 2

Semester III

B240 Genetics I
CS200 Biochemistry I
MP130 Physics for Life Sciences
*Elective*¹
*Elective*¹

Semester IV

B225 Microbiology
H205 Canadian Studies
MP200 Statistics
*Elective*¹
*Elective*¹

¹ *The number of Humanities and Social Science courses must not be fewer than three.*

At the successful completion of this Pre-Vet program, the student has also completed the equivalent of two 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 two more years at NSAC to obtain their B.Sc. (Agr.) degree.

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 1991-92 session).

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

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

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

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

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 MP15, Introductory Physics.

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 during the June supplementary examination period immediately following the failure in courses with a mark of 40% to 49%.

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

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

The fee for a supplemental examination in any course is \$100. If a student does not 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

Technician Programs

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 programs to enroll in another Canadian college for one semester of their second academic year. In this way they broaden their study program.

Other colleges participating with NSAC in this program are:

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

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

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.

Technician Programs

Syllabus

Agricultural Business with minor in

Animal Science

Plant Science

Agricultural Engineering

Year 1

Semester I

CS12	Principles of Soil Science	CS12	Principles of Soil Science	AE12	Drafting
				CS12	Principles of Soil Science
CS14	Agr. Chemistry	CS14	Agr. Chemistry		
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
		EB11	App. Acct. & Taxation	EB11	App. Acct. & Taxation
EB13	Microeconomics				
EB41	Business Law	EB13	Microeconomics	EB13	Microeconomics
MP14	Computational Methods	MP14	Computational Methods	MP14	Computational Methods
PS41	Field Crops II	PS41	Field Crops II		<i>Humanities Elective</i>

Technician Programs

Syllabus

Agricultural Business with a minor in

Animal Science

Plant Science

Agricultural Engineering

Year 2

Semester III

AS20	Farm Animal Breeding	B43 EB40	Entomology Marketing Practices	AE30 EB40	Farm Machinery ^{3 4} Marketing Practices
AS34	Animal Nutrition				
B20	Animal Physiology	EB65	Business Project	EB65	Business Project
EB40	Marketing Practices	EB340	Farm Management I	EB340	Farm Management I
EB65	Business Project	PS53	Vegetable Production ²	MP15	Introductory Physics
EB340	Farm Management I		<i>Humanities Elective</i>	PS40	Field Crops I

Semester IV

AS35	Feeds & Feeding	B40	Plant Pathology	AE34	Farm Tractors ^{3 4}
AS50	Dairy Production ¹	EB41	Business Law	AE38	Horticultural Engineering
AS51	Beef & Sheep Production ¹	EB42	Applied Farm Management	EB41	Business Law
EB42	Applied Farm Management	EB220	Production Economics	EB42	Applied Farm Management
EB220	Production Economics	PS49	Potato Production ²	EB220	Production Economics
	<i>Humanities Elective</i>	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 & 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.

Technician Programs

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

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

Semester II

AE19	Technical Drawing
AE20	Shopwork Practices
AE27	Welding
MP14	Computational Methods
PS30	Agricultural Crops
	<i>Elective</i>

Year 2

Semester III

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

Semester IV

AE36	Controls & Processing
AE65	Project-Seminar
AS30	Animal Science
	<i>Humanities Elective</i>
	<i>Elective</i> ¹
	<i>Elective</i> ¹

¹At 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.

Technician Programs

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

AS20	Farm Animal Breeding	AS20	Farm Animal Breeding
AS34	Animal Nutrition	AS34	Animal Nutrition
B20	Animal Physiology	B20	Animal Physiology
CS12	Principles of Soil Science	CS12	Principles of Soil Science
CS14	Agr. Chemistry	CS14	Agr. Chemistry
H10	Tech. Writing	H10	Tech. Writing

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

Semester II

AS33	Applied Animal Physiology	AE15	Oil Hydraulics ^{1 2}
AS35	Feeds & Feeding	AS33	Applied Animal Physiology
CS13	Soil Management	AS35	Feeds & Feeding
EB41	Business Law	CS13	Soil Management
MP14	Computational Methods	MP14	Computational Methods
	<i>Humanities Elective</i>		<i>Humanities Elective</i>

¹May substitute AE12 Drafting, AE32 Farm Buildings, and AE36 Controls & Processing if timetable permits.

²May substitute AE12 Drafting, AE14 Surveying, and AE45 Soil & Water Management if timetable permits.

Technician Programs

Syllabus

Animal Science with minor in

Agricultural Business

Agricultural Engineering

Year 2

Semester III

AS47	Animal Health	AE30	Farm Machinery ^{1 2}
AS53	Poultry Production ³	AS47	Animal Health
AS65	Project-Seminar	AS53	Poultry Production ¹
EB10	Accounting	AS65	Project-Seminar
EB340	Farm Management I	MP15	Introductory Physics
PS40	Field Crops I	PS40	Field Crops I

Semester IV

AS50	Dairy Production ⁴	AE34	Farm Tractors ^{1 2}
AS51	Beef & Sheep Production ⁴	AS50	Dairy Production ⁴
AS52	Swine Production ⁴	AS51	Beef and Sheep Production ⁴
AS55	Fur Production ⁴	AS52	Swine Production ⁴
EB11	Applied Accounting and Taxation	AS55	Fur Production ⁴
PS41	Field Crops II	PS41	Field Crops II

¹May substitute AE12 Drafting, AE32 Farm Buildings, and AE36 Controls & Processing if timetable permits.

²May substitute AE12 Drafting, AE14 Surveying, and AE45 Soil & Water Management if timetable permits.

³May substitute AS54 Horse Management if timetable permits.

⁴May substitute AS37 Laboratory Animal Care I 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.

Technician Programs

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
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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
	<i>Humanities Elective</i>

Technician Programs

Plant Science

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

Technician Programs

Syllabus

Plant Science with specialization in

Agronomy

Horticulture

Ornamental Horticulture

Year 2

Semester III

AE30	Farm Machinery	MP15	Introductory	PS39	Greenhouse Crop
AS34	Animal Nutrition ¹		Physics		Production
EB340	Farm	PS39	Greenhouse Crop	PS43	Small Fruit Crops
	Management I		Production	PS47	Turfgrass
MP15	Introductory	PS40	Field Crops I		Production and
	Physics	PS43	Small Fruit Crops		Management ¹
PS40	Field Crops I	PS47	Turfgrass	PS50	Landscape
	Humanities		Production and		Horticulture I
	Elective	PS53	Management ¹	PS53	Vegetable
			Vegetable		Production ¹
			Production ¹	PS60	Landscape Plant
					Materials I

Semester IV

AE34	Farm Tractors	B40	Plant Pathology	B40	Plant Pathology
AS35	Feeds and	PS38	Nursery Crop	H140	Personnel
	Feeding ¹		Production		Management
B40	Plant Pathology	PS41	Field Crops II	PS44	Tree Fruit Crops
EB41	Business Law	PS44	Tree Fruit Crops	PS57	Landscape
PS41	Field Crops II		or PS49 Potato		Maintenance
PS49	Potato Production		Production	PS61	Landscape Plant
		PS76	Plant Products		Materials II
			Physiology	PS76	Plant Products
			Humanities		Physiology
			Elective		

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, Chemistry, and Food 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 Laboratory, a Diploma of Technology (Dipl. T.) in Food Laboratory, and a Diploma of Technology (Dipl. T.) in Landscape Horticulture.

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

A candidate for a Diploma of Technology may qualify for admission to the two-year courses 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 Animal Health
AS15	Animal Genetics & Breeding
AS30	Animal Science
AS37	Laboratory Animal Care I
B225	Microbiology
CS43	Bio-Organic Chemistry

Spring Program

AS11	Spring Animal Handling — 6 weeks of approved experience
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Year 2

Semester III

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

Semester IV

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

Year 3

Semester IV (May-December)

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

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 and related fields

Academic Entrance Requirements

High School Graduation Certificate with pass marks in Biology, Chemistry, English, and Mathematics, at the following provincial levels:

New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

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, English, Mathematics, and one other course, all at the following provincial levels:

New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII. Additionally, the applicant must have passed one senior high school chemistry course.

Syllabus

Year 1

Semester I

CS30	Chemical Calculations
CS42	Organic Chemistry
CS68	Introductory Laboratory Techniques
CS100	Chemical Principles I (lectures only)
H10	Technical Writing
MP100	Calculus and Analytic Geometric I

Semester II

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

Year 2

Semester III

CS50	Introduction to Physical Chemistry
CS75	Basic Food Chemistry
CS79	Project Organization
CS220	Introduction to Soil Science
CS305	Instrumental Analytical Chemistry I <i>Elective</i>

Semester IV

CS73	Laboratory Organization and Management
CS80	Project Implementation
CS310	Radiotracers in Agriculture
CS315	Instrumental Analytical Chemistry II
CS350	Food Chemistry
PS30	Agricultural Crops

¹AS100 *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:

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

Academic Entrance Requirements

High School Graduation Certificate with pass marks and an average of at least 60% in Biology, Chemistry, English, Mathematics and one other course all at the following provincial levels:

New Brunswick 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

Syllabus

Year I

Semester I

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

Semester II

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

Year 2

Semester III

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

Semester IV

AE35	Fundamentals of Food Processing
B55	Food Microbiology
CS225	Quantitative Analytical Chemistry
CS315	Instrumental Analytical Chemistry II
CS350	Food Chemistry

Year 3

Semester V

CS85	Food Laboratory Practicum
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Semester VI

AS350	Meat Science
B41	Plant Physiology
CS55	Quality Control & Consumer Acceptance
CS73	Laboratory Organization and Management
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
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Year 2

Semester III

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

Semester 4

B46	Weed Science
H60	Communication Techniques
H140	Personnel Management
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
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Year 2

Semester III

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

Semester IV

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

¹If 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
H10	Technical Writing
MP15	Introductory Physics
PS40	Field Crops I

Semester II

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

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
- AS20 Farm Animal Breeding
- 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
- 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.

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 labs by conducting various surveying exercises. Practice is gained in the proper use of surveying instruments — tape, level, and transit — through exercises involving measurements of horizontal and vertical distances and angles. These include chaining, stadia, benchmark, profile and contour leveling, triangulation and traverse exercises, and construction surveying, with emphasis on their application to farm construction projects.

Fall semester — 2 lecs and 4 labs per week.

Agricultural Engineering

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.

Description of Courses

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.

Agricultural Engineering

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.

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: **Prof. Sibley**

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

Winter semester — 2 lecs and 4 labs per week.

AE39: Tractor Overhaul

Instructor: **Prof. Sibley**

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.

Description of Courses

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: **Prof. Sibley**

Prerequisite: MP15

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

Fall semester — 2 lecs and 4 labs per week.

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

Agricultural Engineering

AE63: Tractor Power

Instructor: **Prof. Sibley**

Prerequisite: MP15

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

Fall semester — 2 lecs and 4 labs per week.

Text — John Deere, *FMO: Tractor Power*.

AE65: Project-Seminar

Coordinator: **To be announced.**

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: **To be announced.**

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: **To be announced.**

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.

Description of Courses

AE90: Technology Project

Coordinator: **To be announced.**

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: **To be announced.**

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*.

Agricultural Engineering

AE150: Engineering in Agriculture (AE)

Instructor: **To be announced.**

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

Fall semester — 3 lecs and 2 labs per week.

AE205: Graphics and Design (EN)

Instructor: **To be announced.**

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*.

Description of Courses

AE231: Agricultural Machinery (AE)

Instructor: **Prof. Rifai**

Prerequisite: MP110 or MP130

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

Fall semester — 3 lecs and 3 labs per week.

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

AE260: Surveying (EN)

Instructor: **Prof. Madani**

Prerequisite: MP100

Preparatory: MP105

An introduction to the use of surveying instruments and practices. Distance measurements, differential 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*.

Agricultural Engineering

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.

Description of Courses

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*.

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).

Agricultural Engineering

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: **To be announced.**

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: **To be announced.**

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.

Description of Courses

Animal Science

AS10: Orientation to Animal Health

Instructor: **Prof. Ramsay**

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

Winter semester — 4 lecs per week.

AS15: Animal Genetics and Breeding

Instructor: **Prof. Crober**

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

Winter semester — 3 lecs and 2 labs per week.

AS20: Farm Animal Breeding

Instructor: **Prof. Patterson**

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

Fall semester — 3 lecs and 2 labs per week.

AS24: Principles of Disease

Instructor: **To be announced.**

Prerequisites: AS10, B15, B20, B225

Corequisite: 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.

Animal Science

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.

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: **Prof. Cock**

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.

AS33: Applied Animal Physiology

Instructor: **Prof. Lirette**

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

Winter semester — 2 lecs and 2 labs per week.

AS34: Animal Nutrition

Instructor: **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.

Description of Courses

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: **Dr. Prowse**

Prerequisites: AS25, B20

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

Prerequisites: B18, 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.

Fall semester — 2 lecs and 2 labs per week.

AS39: Veterinary Laboratory Techniques I

Coordinator: **Prof. Ramsay**

Prerequisites: B225, CS42

Corequisites: 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 practised. In the classroom various aspects of microbes and parasites significant in animal disease are dealt with. Performance in laboratory techniques should demonstrate observance of principles and good manual skills which suggest that improvement will follow opportunities to practise in later similar courses and the externship period.

Fall semester — 3 lecs and 4 labs per week.

Animal Science

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 principle good manual skills, which suggest that further improvement will follow opportunities to practise during AS85 Practicum 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: **Prof. Tennessen**

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.

Description of Courses

AS50: Dairy Production

Instructor: **Prof. Fredeen**

Prerequisites: AS20, B20, AS34

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

Winter semester — 3 lecs and 2 labs per week.

AS51: Beef and Sheep Production

Instructors: **Profs. Farid and Lirette**

Prerequisites: AS20, B20, AS34

Deals with the objectives and methods of producing beef cattle, 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: AS20, B20, AS34

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

Winter semester — 2 lecs and 4 labs per week.

Text — Krider, Conrad, and Carroll, *Swine Production*.

AS53: Poultry Production

Instructor: **Prof. Crober**

Prerequisites: AS20, 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. Tennessen**

Prerequisites: AS20, 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.

Animal Science

AS55: Fur Production

Coordinator: **Prof. A. Hawley**

Prerequisites: AS20, 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.

AS59: Veterinary Laboratory Techniques III

Coordinator: **Prof. Ramsay**

Prerequisites: AS49, AS85

Corequisite: AS58

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

Winter semester — 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 competence in all pertinent skills.

Winter semester — 3 lecs and 4 labs per week.

Description of Courses

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 at near to 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 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 a technical and/or minor research nature and 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: **Prof. Firth**

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: **Prof A. Hawley**

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.

Description of Courses

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

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

Fall semester — 3 lecs and 2 labs per week.

AS315: Reproductive Physiology (A)

Instructor: **Prof. A. Hawley**

Prerequisite: AS300

A study of the physiology of reproductive processes in animals and birds. Areas discussed include 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: **Dr. Semple**

Prerequisites: AS100, B225

Preparatory: CS205

Seeks to impart an understanding of animal health and its importance in livestock production enterprises. Students are taught to recognize signs of health and ill-health and to understand the principles and practices of disease prevention and treatment.

Conditions of disease and ill-health common in Atlantic Canada are studied. The need for veterinary collaboration is emphasized, and the circumstances in which this should be sought are discussed.

Winter semester — 2 lecs and 2 labs per week.

Animal Science

AS325: Applied Animal Nutrition (A)

Instructor: **Prof. Fredeen and Anderson**

Prerequisite: AS305

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

Winter semester — 3 lecs and 2 labs per week.

Text — Church, *Livestock Feeds and Feeding*.

AS335: Environmental Physiology (A)

Instructor: **Prof. Tennessen**

Prerequisite: AS300

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

Winter semester — 2 lecs and 2 labs per week.

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.

Description of Courses

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.

AS449: Project-Seminar I (A)

Instructors: **Animal Science Faculty**

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

Animal Science majors in their final year select, in consultation with a faculty advisor, a research 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.

Fall semester — 2 labs per week.

AS450: Project-Seminar II (A)

Instructors: **Animal Science Faculty**

Prerequisite: AS449

Winter semester — 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. Tennessen**

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: **Prof. Farid**

Fall semester — 3 lecs and 2 labs per week.

AS425: Poultry Production (A)

Instructor: **Prof. Crober**

Winter semester — 3 lecs and 3 labs per week.

Text — North, *Commercial Chicken Production Manual*.

AS430: Fur Animal Production (A)

Instructor: **Prof. A. Hawley**

Winter semester — 2 lecs and 2 labs per week.

Description of Courses

Biology

B01: Pre-Tech Biology

Instructors: **To be announced.**

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. Gray**

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

Winter semester — 2 lecs and 3 labs per week.

B41: Plant Physiology

Instructor: **Prof. Eaton**

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

Winter semester — 3 lecs and 3 labs per week.

B43: Entomology

Instructor: **Prof. Le Blanc**

An introduction to the study of the phylum Arthropoda, with particular reference to the class Hexapoda (Insecta), emphasizing some insect pests of Atlantic Canada. Anatomy, physiology, taxonomy, 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.

Description of Courses

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.

B55: Food Microbiology

Instructor: **To be announced.**

Prerequisite: B225

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

Winter semester — 3 lecs and 4 labs per week. 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.

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.

Biology

B100: Botany (S)

Instructor: **Prof. Olson**

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

Fall semester — 3 lecs and 4 labs per week.

B110: Zoology (S)

Instructor: **Prof. Crosby**

A general introduction to zoology. Topics include animal cells and tissues, animal form and function, reproduction and development, 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 eucaryotic cell, cell growth, the procaryotic 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: **Prof. Atlin**

Study of heredity and variation in plants and animals, including man; the relationships of genetics to evolution and breeding practices.

Fall semester — 3 lecs and 2 labs per week.

B245: Genetics II (A)

Instructor: **Prof. Atlin**

Prerequisite: B240

A study of the genetic basis for plant and animal improvement including population and molecular genetics.

Winter semester — 3 lecs and 2 labs per week.

Description of Courses

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.

Text — Roland and Smith, *Flora of Nova Scotia*; Smith, *Vascular Plant Families*.

B270: Structural Botany (S)

Instructor: **Prof. Olson**

The basic morphology and anatomy of the seed plants are presented from a developmental perspective. The structural aspects of the various modes of plant reproduction are also included. The emphasis of the course is placed on obtaining an understanding of plant structure that will complement crop physiology, weed biology, and plant pathology.

Winter semester — 3 lecs and 3 labs per week.

B300: Principles of Plant Pathology (A)

Instructor: **Prof. Gray**

Deals with the principles of plant pathology and the control of diseases caused by bacteria, fungi, mycoplasma-like organisms, viruses, and nematodes. Labs deal with simple techniques used in plant pathology, such as fungal, bacterial and nematode isolation, identification, and inoculation.

Fall semester — 3 lecs and 3 labs per week.

Biology

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* (6th edition).

B325: Economic Entomology (A)

Instructor: **Prof. Le Blanc**

Prerequisite: B320

Preparatory: B110

An introduction to the study of economic entomology from an agricultural perspective. Principles of insect control — natural, mechanical, physical, cultural, biological, and legal — are covered. Includes chemical and biochemical control, and insecticide development, formulation, and application. This course stresses the theory of integrated pest management (IPM).

Winter semester — 3 lecs and 3 labs per week.

Description of Courses

B330: Ecology (S)

Instructor: **Prof. Nams**

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.

B345: Applied Weed Science (A)

Instructor: **Prof. Sampson**

Prerequisite: B335

Deals with principles of weed science from an ecological perspective. Included are discussions on ecology and management of weeds in traditional agroecosystems as well as in low input sustainable agricultural systems. The role of biological, cultural, and chemical control in these systems will be stressed. Biorational approaches to weed control and the role of biotechnology in development of new weed control systems, including herbicides, will be included in discussions.

Winter semester — 3 lecs and 3 labs per week.

Biology

B350: Ecological Methods (S)

Instructor: **Prof. Nams**

Prerequisite: B330

An introduction to selected methods pertinent to the study of ecological populations. Topics will include sampling techniques, dispersion studies, estimates of population density, population dynamics, systems analysis and modelling, as well as the construction of energy budgets. Laboratory and field work will include practical data acquisition, organization, and computerized statistical analysis.

Winter semester — 3 lecs and 4 labs per week.

B360: Environmental Analysis (S)

Instructor: **Prof. Stratton**

Prerequisites: B200, B225, CS205

A study of the analytical techniques and instrumentation used to measure and quantify biological processes in the environment. These will include techniques such as microscopy, photomicroscopy, gas chromatography, high pressure liquid chromatography, electrophoresis, and genetic engineering.

Fall semester — 3 lecs and 4 labs per week.

B365: Environmental Impact (S)

Instructor: **Prof. Stratton**

Prerequisites: B330, B360

An introduction to the study of environmental toxicity and ecotoxicology as they are used to predict the environmental impact of agricultural, industrial, and other xenobiotics and associated processes. The laboratory portion of the course will deal primarily with bioassay techniques.

Winter semester — 3 lecs and 4 labs per week.

B385: Principles of Pest Management (A)

Instructor: **Biology Department Faculty**

Prerequisites: B100, B110

An investigation of the philosophy of pest management. Topics will include the study of different approaches to pest management and an assessment of the use of single versus integrated pest control options. Costs of pest control from economic, social, and environmental perspectives will be discussed. This course cannot be taken for credit by students in the Plant Protection major or Plant Science option.

Fall semester — 3 lecs and 3 seminar periods per week.

Description of Courses

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.

B430: Ecology of Agriculture (A)

Instructor: **Prof. Nams**

Prerequisite: B330

Agricultural production systems are examined from an ecological perspective. Students acquire an understanding of the interactions and dynamics of the major components of agroecosystems. The possible modification and application of ecological principles to problem solving in local and global food production are emphasized.

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

B449: Project-Seminar I (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 and Soil Science

Chemistry and Soil Science

CS01: Pre-Tech Chemistry

Instructor: **Prof. Hawley**

An introductory course emphasizing measurement in chemistry, matter and energy, atomic structure, electronic arrangement of the atom, and chemical bonding. The periodic table is studied, and considerable emphasis is placed on the use of symbols, formulae, equations, and reactions. Some time is also spent on chemical kinetics, problem solving, solutions and electrolysis, and acid-base reaction.

Winter semester — 3 lecs and 3 labs per week.

Text — Seese and Daub, *Basic Chemistry* (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).

Description of Courses

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: **Prof. Crowe**

A laboratory course which familiarizes the students with testing methods used specifically in the food industry. Students will be exposed to the theory and practical aspects of sampling, sample preparation, analyses, and data interpretation.

Winter semester — 2 lecs and 4 labs per week.

CS42: Organic Chemistry

Instructor: **Prof. Payne**

An introductory course designed to familiarize the student with the theories and principles of organic chemistry as they apply to certain basic classes of organic compounds, including alkanes, alkenes, alkynes, polyolefins, aromatic hydrocarbons, alcohols, and mercaptans. The nomenclature of these classes of compounds and their application to plant and animal life are stressed. Laboratory procedures are correlated with lecture material; modern procedures and techniques are employed to illustrate the preparation, extraction, purification, and properties and reactions of various organic compounds discussed.

Fall semester — 3 lecs and 4 labs per week.

Text — Fessenden and Fessenden, *Fundamentals of Organic Chemistry*.

CS43: Bio-Organic Chemistry

Instructor: **Prof. Payne**

Prerequisite: CS42

A continuation of the introduction to the basic classes of organic compounds. Aldehydes, ketones, amines, carboxylic acids, and their derivatives are studied. The student is also introduced to biochemistry through a preliminary study of carbohydrates, lipids, proteins, nucleic acids, vitamins, hormones, and enzymes. Laboratory exercises closely parallel the topics presented in lecture and are designed to make the student aware of the properties and reactions characteristic of the organic and biochemical compounds studied.

Winter semester — 3 lecs and 4 labs per week.

Text — Fessenden and Fessenden, *Fundamentals of Organic Chemistry*.

Chemistry and Soil Science

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: Quality Control and Consumer Acceptance

Instructor: **To be announced.**

The design and implementation of quality control programs will be covered. The effect of raw material, material handling, storage, processing parameters, packaging, and warehousing on quality will be studied. Nutritional labelling, product regulations, and the role of the various food enforcement agencies will be discussed. Students will also become familiar with some of the factors affecting consumer acceptance. They will gain experience with some of the basic sensory evaluation techniques used in product development.

Winter semester — 3 lecs and 3 labs per week. 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 T.L.C.

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: **Prof. Crowe**

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.

Description of Courses

CS73: Laboratory Organization and Management

Instructor: **To be announced.**

Students are instructed in lab design and operation, ordering of supplies, organizing data and records, supervising staff, and WHMIS safety regulations. Students are challenged to apply their technical knowledge to the workplace and to gain an understanding for their role as a lab technologist.

Winter semester — 2 lecs and 4 labs per week.

CS75: Basic Food Chemistry

Instructor: **Prof. Robinson**

Prerequisites: CS42, CS43

A study of the chemistry and technology of carbohydrates, fats, and proteins. Attention is directed towards the basic principles involved in their determination in foods and feeds. The laboratory deals with the qualitative and quantitative physical and chemical techniques used in the analysis of foods and feeds.

Fall semester — 3 lecs and 4 labs per week.

Text — Meyer, *Food Chemistry*.

CS79: Project Organization

Coordinator: **Prof. Payne**

A chemistry project organized on an individual basis with each student.

Fall semester — 6 to 8 labs per week as assigned.

CS80: Project Implementation

Coordinator: **Prof. Payne**

A seminar program with subject matter related to material covered in CS79 project.

Winter semester — 6 to 8 labs per week as assigned.

CS85: Food Laboratory Practicum

Coordinator: **Prof. Crowe**

This Food Lab Practicum is designed to provide the students with "hands-on" experience and instruction in a typical workplace setting. In their third year of the Food Lab Technology program, the student will spend September to December in this practicum. Wherever possible, students will be placed with cooperating food industries most closely in line with the student's interests.

Prospective employers of the Food Lab Technology students could include dairies, wineries, breweries, product development and quality control laboratories, as well as firms involved in the processing of meat, fish, vegetables, fruits, and cereals.

In addition to this practicum, students are encouraged to pursue summer employment within the food industry.

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

Chemistry and Soil Science

CS100: Chemical Principles I (S)

Instructor: **Prof. MacConnell**

Prerequisite: University Preparation Grade XII Chemistry (N.S. 441 or 442, N.B. 121 or 122)

A study of atomic theory, periodicity, chemical reactions, thermochemistry, geometrical forms of molecules, chemical equilibrium, and oxidation-reduction reactions. Also included is an extensive study of the chemistry of solutions of weak electrolytes.

Fall semester — 3 lecs and 4 labs per week.

Text — McQuarrie and Rock, *General Chemistry* (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 — 1 lec, 2 tutorials, 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 — Rawn, *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 — Rawn, *Biochemistry*.

Description of Courses

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. Next offered in 1992-93.

Text — McQuarrie and Rock, *General Chemistry* (2nd 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 — Harris, *Quantitative Chemical Analysis* (2nd edition).

Chemistry and Soil Science

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. Next offered in 1992-93.

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

CS305: Instrumental Analytical Chemistry I (S)

Instructor: **Prof. Crowe**

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, *Radiotracer Methods in the Biological, Environmental and Physical Sciences*.

Description of Courses

CS320: Soil Fertility (A)

Instructor: **Prof. Warman**

Prerequisite: CS220

Preparatory: B260

Includes essential plant nutrients in the soil, influence of soil chemical and physical properties on nutrient absorption and plant growth, methods of evaluating soil fertility and composition, and use of organic and inorganic sources of nutrients.

Winter semester — 3 lecs and 4 labs per week.

CS325: Soil Genesis and Classification (A)

Instructor: **Prof. Brewster**

Prerequisite: 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 MP222

A study of the physical properties of soil and the physical processes taking place in soil. This course will investigate the solid, liquid, and gaseous phases of soil, their interrelationships, and their effects on plant growth. The major portion of the course will deal with the mechanisms, measurement, and mathematical description of the storage and movement of water in soil.

Winter semester — 3 lecs and 4 labs per week. Next offered in 1992-93.

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.

Chemistry and Soil Science

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 hypothalamus, hypophysis, and adrenals.

Winter semester — 3 lecs per week.

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

Description of Courses

CS370: Instrumental Food Analysis

Instructor: **Prof. Crowe**

Prerequisite: CS110 or CS42

Corequisite: CS305

This course, which complements CS305 and CS350, emphasizes use of instrumental techniques to analyze food constituents and residues. Included are the flavor, color, and texture of foods. The chemical and nutritional safety of foods will also be discussed. The laboratory section will incorporate types of instrumental analysis not studied in CS305 or CS350.

Winter semester — 3 lecs and 4 labs per week.

CS415: Special Topics in Chemistry and Soils (A)

Instructors: **Chemistry and Soil Science Staff**

An optional course for Agricultural Chemistry and Soil Science students who want to study a special topic in their final year. Course material will be arranged with Chemistry and Soil Science 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. Next offered in 1992-93.

CS449: Project-Seminar I (A)

Coordinator: **Prof. Brewster**

A required course for all Agricultural Chemistry and Soil Science students. Each student will be assigned a research project requiring library and laboratory investigative procedures. Each student will present periodic oral reports and a written 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

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 4 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: **Mrs. Gallant**

An introduction to the study of macroeconomics in a Canadian context. Topics covered include national accounts, public finance, money and banking, and international trade. Current problems in the Canadian economy are examined to emphasize the theory.

Fall semester — 3 lecs per week.

Text — Lyons, *Canadian Macroeconomics*.

Description of Courses

EB13: Microeconomics

Instructor: **Mrs. Gallant**

An introduction to the theory of the firm. The course examines the theory of demand and supply, distribution of income, forms of business organizations in Canada, and the levels of competition in the agricultural industry. Application of the various theories to explain the agricultural industry is stressed.

Winter semester — 3 lecs per week.

EB40: Marketing Practices

Instructor: **Prof. Russell**

Preparatory: EB13

Current practices involved in marketing farm products produced in the Atlantic Provinces are studied. The conditions affecting these practices and the groups of people that can bring about changes are identified. Special attention is paid to consumer 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.

Economics and Business

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.

Description of Courses

H140: Personnel Management (E or H)

Instructor: **Prof. Russell**

An introduction to the human side of business organizations. The course focuses on the challenges of motivation, recruitment and selection, performance evaluation, compensation, and labor-management relations.

Winter semester — 3 lecs per week.

EB200: Microeconomics I (E)

Instructor: **Prof. Stackhouse**

Prerequisites: EB110, MP100

Introduces the principles of neoclassical microeconomic theory using graphical and mathematical analysis. Areas of emphasis include: 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.

Economics and Business

EB220: Production Economics (E)

Instructor: **Prof. Tait**

An introduction to the study of economic principles used to analyze production and resource use in agriculture. Areas of emphasis include economic examination of the factor-factor, factor-product, and product-product relationships of the farm production system. Practical examples and lab exercises are used to illustrate and reinforce the concepts presented in the classroom.

Winter semester — 2 lecs and 4 labs per week.

EB260: Mathematical Economics (E)

Instructor: **Prof. Stackhouse**

Prerequisites: MP100, EB110

Introduction to the frequently used mathematical methods of economic analysis. The course provides the student with the basics required in more advanced economics courses. Areas of concentration include: elements of mathematical economics models, linear models and matrix algebra, applications of calculus to economic problems, and optimization theory.

Fall semester — 3 lecs per week.

EB310: Cost Accounting (E)

Instructor: **Prof. Russell**

Prerequisite: EB210

An introduction to the uses of accounting data for managers. Areas of emphasis include planning, control, and decision making.

Fall semester — 3 lecs and 1 tutorial per week.

EB325: Operations Research (E)

Instructor: **Prof. Stackhouse**

Prerequisite: EB260

An introduction to mathematical programming. Major emphasis is placed on linear programming and the role of matrix algebra in determining linear programming solutions. The information requirements, organization, and skills of model building are also developed.

Winter semester — 4 lecs and 1 lab per week.

EB330: Agricultural Markets and Prices (A)

Instructor: **Prof. Grant**

Prerequisite: EB205

Designed to introduce students to agricultural market and price analysis. In general, course topics include econometric estimation of supply and demand relationships for agricultural commodities, applications of price theory, and discussion of pricing institutions in the agricultural industry.

Winter semester — 3 lecs and 2 labs per week.

Description of Courses

EB335: Business Marketing (E)

Instructor: **Prof. Russell**

Designed to introduce basic marketing principles and their application to marketing problems. Topics such as promotion, pricing, distribution, and marketing research are examined. The case method of instruction is used extensively. Class participation is a vital component of this course.

Fall semester — 3 lecs and 2 labs per week.

EB340: Farm Management I (A)

Instructor: **Prof. Tait**

Principles and methods of organizing and analyzing farm businesses are examined. Practical problems associated with financial analysis, planning, capital budgeting, resource use, and credit acquisition are included. The role of the farm manager is identified throughout.

Fall semester — 2 lecs and 4 labs per week.

EB355: Macroeconomics I (E)

Instructor: **Prof. 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.

Economics and Business

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: **Prof Russell**

Prerequisites: EB325, EB340

An applied course intended to utilize the farm management principles developed in Farm Management I. Students are introduced to computerized farm planning models and are required to apply these methods to actual farm problems.

Winter semester — 2 lecs and 3 labs per week.

Description of Courses

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.

Humanities

H50: Core Language Skills

Instructor: **Prof. Sanger**

The objective of the course is to provide basic instruction in writing and reading. Emphasis is placed upon spelling, correct grammar, sentence and paragraph structure, and analysis of methods of presentation and argument. The course is entered by means of an evaluation test administered in H100 during the first week of classes. Instruction is individualized. Students meet the instructor privately by appointment.

This is a non-credit course which does not appear on student transcripts. Those students placed in the course must pass it before being able to take an H300 level course.

H60: Communication Techniques

Instructor: **Prof. Sanderson**

This subject has limited enrollment.

The purpose of this course is to encourage the development of students' communication skills. The course will concentrate on improving students' speaking skill plus incorporating audio-visual materials. Creative presentation of ideas through exhibits, slide presentations, and video will be a focus of a number of the sessions. Guest speakers in the area of advertising and marketing will be invited. Evaluation for the course will be based primarily on a number of projects such as a slide-tape presentation.

Winter semester — 3 labs per week.

H100: Technical Writing (H)

Instructor: **Prof Sanger**

The course is divided into four parts. The first deals with library use, with emphasis upon information retrieval systems specific to agriculture and science. The second provides instruction in the writing of scientific reports. The subject of the third is the writing of business letters, with particular attention to job applications. The fourth involves reading a set of texts of relevance to agriculture and science. Students must write a major essay, involving library research on an assigned topic.

Fall semester — 3 lecs per week.

H120: Rural Sociology I (H)

Instructor: **Mr. Settle**

An introduction to "rural sociology" as a discipline of study through assigned text, selected readings and lectures. The course will explore the nature of "rural" society, social and cultural changes and the role of groups, social class, and organizations. Concepts of rural neighborhood, community, town, and trade centres will be examined in an Atlantic Canadian context. The role of family, rural institutions, and organizations (especially farm organizations and co-operatives) will be studied. Changes affecting rural communities and primary resource industries will be explored. A section will be devoted to the history of Canadian farm and other rural organizations, how they function, their accomplishments, etc. Sustaining future rural communities will be the final emphasis covered.

Fall semester — 3 lecs per week.

Description of Courses

H125: Sociological Studies (H)

Instructor: **To be announced.**

A complete course description is available on application to the Humanities Department.

Winter semester — 3 lecs per week.

H130: 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.

This course is designed for Anglophone students. Enrollment may, in certain cases, depend upon the instructor's evaluation.

Winter semester — 3 lecs per week.

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

H140: Personnel Management (E or H)

Instructor: **Prof. Russell**

This course is a Humanities elective which is offered by the Department of Economics and Business Management. Please turn to that section of this Calendar for a course description.

Winter semester — 3 lecs per week.

H150: Agriculture Today (H)

Instructor: **Prof. Crouse**

The course offers a basic overview of the agricultural industry in the Atlantic Provinces. Production trends and limiting factors, agricultural research, farm organizations, and government role in the industry are studied to provide an awareness and appreciation of Atlantic agriculture, the major things happening in it, and the new technology associated with it.

The progress of the local industry and current issues are followed up through weekly reading assignments and class presentations. Commodity updates are presented through student seminars.

This is a discussion-based course requiring class participation.

Winter semester — 3 lecs per week.

Humanities

H205: Canadian Studies (H)

Instructor: **Prof. Sanger**

Objectives of this course are to provide a general survey of Canadian literature from colonial times to the present and to examine specifically four or five twentieth-century Canadian novels. Books by Callaghan, MacLennan, Ringuet, Aguin, O'Hagan, Atwood, Buckler, Ethel Wilson, and Davies have been used. Students must write a major term paper.

All tests, exams, and written assignments in this course may be carried out in French. Required texts, when available in that language, may be read in French.

Winter semester — 3 lecs per week.

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: History of Scientific and Agricultural Thought (H)

Instructor: **Prof. Sanger**

The objective of this course is to examine some of the key texts which have influenced the course of science and agriculture. Emphasis is placed upon the close reading of primary sources, beginning with the classical world of Greece and Rome and extending to the modern world. Among the areas to be examined may be the work of the Pre-Socratics, Plato, Aristotle, Cato, the place of nature and agriculture in medieval society, and the development of biology and physics from the sixteenth to twentieth centuries. One of the main themes of the course will be the nature of scientific discovery and cognition. Another will be the place of humankind in nature. In addition to a final exam, students must either write one major term paper or submit an acceptable journal of natural observations.

Fall semester — 3 seminars per week.

Description of Courses

H320: Extension Education in the Rural Community (H)

Instructor: **Prof. Sanderson**

Prerequisites: 20 degree subjects or approval of the instructor.

The aim of this course is to provide students with a basic understanding of the principles and theories of extension education in rural society. The first part of the course will discuss trends in the rural community 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: 20 degree subjects including H200, or 12 technical subjects.

Technician students require H10.

This course is designed to provide students with an understanding of the basic concepts involved in communicating ideas in an agricultural setting. The adult as a learner is featured in a discussion of the basic concepts involved in planning adult programs. Emphasis is placed on gaining practical experience in the use of media. Various types of media, such as radio, newspapers, television, and film, are examined. Assignments include: preparing advertising or publicity, using photography, 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.

H400: Issues in Agriculture (H)

Coordinators: **Prof. Tennessen, Animal Science; Prof. Warman, Chemistry and Soil Science**

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.

Mathematics and Physics

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

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 arithmetic and algebraic skills needed for the course are developed as the need arises through self-instructional modules.

Winter semester — 3 lecs and 2 labs per week.

MP15: Introductory Physics

Instructor: **Prof. Pearson**

A survey course in classical physics, designed to provide technicians with the principles of physics important to the study and practice of agriculture. Content and instruction are at the Grade 12 level. The major areas of study include: concepts of measurement, dynamics, statics, heat theory, and electricity. Certain topics in modern physics will be introduced as time permits. The laboratory sessions consist of student-performed experiments and problem tutorials.

Fall semester — 3 lecs and 2 labs per week.

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.

Description of Courses

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. A non-credit course.

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. A non-credit course.

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*.

Mathematics and 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

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 MP222.

Fall semester — 3 lecs and 2 labs per week.

Description of Courses

MP222: Computer Methods (M)

Instructor: **Prof. Farmer**

A course to develop problem-solving and decision-making abilities and computational skills using software available on both minicomputer and microcomputer systems. Problems of a scientific and managerial nature will be chosen from a variety of agricultural fields. Topics to be covered consist of word processing, spreadsheets, database, programming, statistics, communications, graphics and process control. Industry leading software will be used. 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.

Mathematics and Physics

MP330: Agrometeorology (A)

Instructor: **Prof. S. Smith and Mr. Gordon**

Prerequisite: MP130

Introduction to the weather and climate of the Atlantic region. The course will cover the basics of the surface weather systems, the energy balance of crops, and the factors determining the climate of the region. The final phase will look at how weather information is used to predict crop maturity, yield, disease severity, or insect pest levels.

Winter semester — 3 lecs and 2 labs per week.

Description of Courses

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*.

Plant Science

PS40: Field Crops I

Instructor: **Prof. Bubar**

A study of grasses, legumes, and other crops grown for forage or grain; factors influencing adaptation and distribution of these crops. Emphasis is placed on crops and conditions in the Atlantic Provinces.

Fall semester — 3 lecs and 2 labs per week.

PS41: Field Crops II

Instructor: **Prof. Martin**

Prerequisite: PS40

A 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.

Description of Courses

PS50: Landscape Horticulture I

Instructor: **Prof. Goodwin**

An introduction to landscape horticulture, including the history of old world influences on North American horticulture development. Plant-environment interaction and the fundamental principals governing plant growth are discussed, as well as the functional uses of ornamental plants in the contemporary landscape. Laboratory exercises will concentrate on the basic skills associated with the use of plants in the landscape.

Fall semester — 3 lecs and 4 labs per week.

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

PS51: Residential Landscape Design and Construction

Instructor: **Prof. Higgins**

Prerequisites: AE12, PS50, PS60

Residential landscape design and construction is studied. A systematic and practical approach to design is emphasized.

Winter semester — 3 lecs and 3 labs per week.

Text — Hannebeum, *Landscape Design*.

PS53: Vegetable Production

Instructor: **Prof. 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*.

Plant Science

PS57: Landscape Maintenance

Instructor: **Prof. Goodwin**

Prerequisites: AE38, PS47, PS50

Provides an overview of site management. Emphasis is placed on problem solving, horticultural maintenance equipment, and on pesticides and their application. Time studies and the scheduling of horticultural work are included. A calendar of landscape maintenance tasks is developed by the student. Student seminar presentation is an important component of this course.

Winter semester — 3 lecs per week.

PS60: Landscape Plant Materials I

Instructors: **Profs. Higgins, Olson, and Mrs. Murray**

Deciduous trees, shrubs, and vines are studied with respect to their identification and landscape value. The lab involves the study of plant families, plant morphology, use of plant keys, plant collecting and preparation of herbarium specimens. A plant collection is required.

Fall semester — 3 lecs and 3 labs per week.

Texts — Dirr, *Manual of Woody Landscape Plants*; Roland and Smith, *Flora of Nova Scotia*; Smith, *Vascular Plant Families*.

PS61: Landscape Plant Materials II

Instructors: **Prof. Higgins and Mrs. Murray**

Landscape plant materials are studied with respect to their identification. Broad-leaf and narrow-leaf evergreens, foliage plants for interior landscapes, annuals, and perennials are studied. Recognition of deciduous trees and shrubs by winter wood characteristics is also covered. Sketching is a component of this course.

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.

Description of Courses

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, and sales, and will reflect the specialties of the employer.

Spring semester — 6 weeks.

PS71: Arboriculture

Instructor: **Prof. Goodwin**

Prerequisite: PS50

Emphasis is placed on arboriculture theory and practice. Tree problems arising from pest and disease injury, as well as environmental and non-parasitic injury of trees will be addressed. The course will focus on the tree in an urban environment. Laboratory exercises concentrate on specific arboriculture skills and techniques.

Fall semester — 3 lecs and 4 labs per week.

Text — Harris, *Care of Trees, Shrubs and Vines in the Landscape*.

PS72: Landscape Maintenance

Instructor: **Prof. Goodwin**

Prerequisites: PS47, PS71, PS73, AE38

Provides an overview of site management. Emphasis is placed on problem solving, horticultural maintenance equipment, and on pesticides and their application. Time studies and the scheduling of horticultural work are included. A calendar of landscape maintenance tasks is developed by the student. Student seminar presentation is an important component of this course.

Winter semester — 3 lecs per week.

PS73: Landscape Horticulture II

Instructor: **Prof. Higgins**

Prerequisites: PS51, PS61

A study of herbaceous plants and their uses in landscape. Special plant groups, gardening techniques and styles will be examined. Plant identification is a component of this course.

Fall semester — 3 lecs and 2 labs per week.

Text — Buckley, *Canadian Garden Perennials*.

Plant Science

PS74: Landscape Design and Construction

Instructor: **Prof. Higgins**

Prerequisite: PS73

Advanced landscape planning and construction will be discussed. Such topics as site, furniture, decks, roofscapes, interior plantscapes, and estimating are included. Plant identification is an important component of this course.

Winter semester — 3 lecs and 3 labs per week.

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. Nowak**

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

Winter semester — Time to be announced.

PS100: Principles of Crop Production (A)

Instructor: **Profs. Caldwell and 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*.

Description of Courses

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: **Prof. Martin**

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.

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

Plant Science

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.

PS320: Small Fruit Crops (A)

Instructor: **Prof. Ju**

Prerequisites: PS100, B100

Preparatories: B260, B265

Principles and practices of small fruit production, history, biosystematics, adaptation, distribution, pest control, breeding of new cultivars, and propagation, storage, and marketing are studied. This course is offered in alternate years.

Fall semester — 3 lecs and 2 labs per week. Next offered in 1992-93.

PS325: Potato Production (A)

Instructor: **Prof. Asiedu**

Prerequisites: PS100, B100

Preparatories: B260, B265

History, biosystematics, growth, and development of the crop. Culture through seed preparation, sprouting, growth, tuberization, maturation and storage for seed, table, and processing are studied in detail. Fertility practices and pest management, breeding and use of cultivars, and nutritional qualities of the crops are considered. Production practices in the Atlantic Provinces are examined in detail.

Winter semester — 3 lecs and 2 labs per week.

PS330: Greenhouse Crop Production and Floriculture (A)

Instructor: **Prof. Mapplebeck**

Prerequisites: PS100, B100

Preparatories: B260, B265

Construction and equipment of greenhouses and related structures. Physiological principles involved in the growing and correct timing of vegetables and flower crops are studied and related to commercially viable plant production. Plant nutrition, propagation, and greenhouse management are also considered.

Winter semester — 3 lecs and 2 labs per week.

Description of Courses

PS335: Landscape Plant Production (A)

Instructor: **Prof. Mapplebeck**

Prerequisites: PS100, B100

Preparatories: B260, B265

Production of landscape plant materials is studied in detail. More specifically, this course covers plant propagation techniques, nursery culture and equipment, harvesting, storage, transportation, and garden centre handling and sales of plants. This course is offered in alternate years.

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

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. Next offered in 1992-93.

PS350: Plant Biochemistry (A)

Instructor: **Prof. Nowak**

Prerequisites: B260, CS200

A study of plant metabolism in crop management systems. Metabolic regulations in plant cells and their relation to nutrition, use of pesticides and environmental stresses will be the main focus of this course. Plant-microbial interaction and molecular approaches for the manipulation of developmental processes in plants will also be considered. The course will alternate with PS475 (see Graduate Courses).

Winter semester — 2 lecs and 4 labs per week.

PS355: Tropical Agriculture (A)

Instructor: **Prof. Asiedu**

Prerequisites: PS100, AS100, EB110, and CS220

This course will introduce the student to food production, storage, and handling systems in tropical countries. The sustainability of these systems, and issues which limit the use of the environment for long-term food production will be identified. The instruction will include resource people from several disciplines.

Fall semester — 3 lecs per week.

PS400: Plant Breeding (A)

Instructor: **Prof. Atlin**

Prerequisites: B240, MP200, one crop production subject

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.

Plant Science

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.

PS410: Horticulture (A)

Instructors: **Prof. Daniels and Horticultural Staff**

Prerequisites: PS415, PS449, and three horticultural production courses

The objective is to review and integrate material from prerequisite courses on horticultural crops production, soil, climate and basic sciences into crop management systems. Students successfully completing this course will qualify to be identified as horticulturalists.

Winter semester — 3 lecs per week.

PS415: Crop Adaptation (A)

Instructor: **Prof. Martin**

Prerequisites: Two crop production subjects

Preparatory: B330

Crops in relation to environmental influences, such as temperature, light, soil, water, and biotic factors of where crops are grown. Approaches to expanding areas of adaptation and distribution are considered. A term report is required.

Fall semester — 3 lecs and 2 labs per week.

PS449: Plant Science Project-Seminar I (A)

Coordinator: **Prof. Daniels**

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: **Prof. Daniels**

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**

Prerequisite: AS300, AS305, CS360

This course is designed to provide an intensive study of the physiology of food intake and digestion, and nutrient absorption and metabolism, in the ruminant animal. The course will detail current knowledge and focus on aspects of future research interest. Students will be expected to contribute to discussions and present reviews to the class on various aspects of the subject. The course is recommended for graduate students and senior undergraduates interested in pursuing graduate studies.

Fall semester — 3 lecs and 2 labs per week. Next offered in 1992-93.

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.

Winter semester — equivalent to 5 periods per week. Timetable is arranged by course coordinator.

PS475: Plant Biotechnology (A) (Also listed at Dalhousie University)

Instructor: **Prof. Nowak**

This course has a limited enrollment.

Culture of plant cells, tissues and organs, somatic embryogenesis and organogenesis, screening for pathogen and stress tolerance, and the application 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. Next offered in 1992-93.

Text — 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 1991-92 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 \$120 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 893-6666.

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

\$2,000

Three scholarships of \$2,000 each are offered annually to students with the highest averages in the subjects required for entrance. All students who apply for admission are considered.

These scholarships are continuous at NSAC for the normal duration of the program. Provided the recipients have maintained the 80% level in the work of the previous year with no failed subjects, \$2,000 will be offered at the beginning of each academic year. For those whose averages at NSAC drop below 80%, but remain above 75%, the amount of the annual scholarship will be \$750.

\$1,500

Scholarships of \$1,500 each are offered to all students (except those selected for the \$2,000 level) who are accepted and have averages of 80% or higher in the subjects required for entrance.

These entrance scholarships become continuous for those students who maintain scholarship level at NSAC. For those who maintain an 80% average with no failed subjects, \$1,500 is offered each year for the normal duration of the program. For those whose averages at NSAC drop below 80%, but remain above 75%, the amount of the annual scholarship will be \$750.

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 \$500 for all residents of Nova Scotia accepted for the technical programs 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, \$500 is offered for students admitted to the second and third years of their programs.

Canada Scholarships Program

The Department of Industry, Science and Technology of the federal government of Canada provides competitive scholarships to encourage the pursuit of undergraduate degrees in the natural sciences and engineering. The scholarships are valued at \$2,000 per year, renewable for up to four years, conditional upon the maintenance of first class standing. Applications may be obtained from high school guidance offices or from the NSAC. Closing date for applications is June 21.

Scholarships and Bursaries

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, and participation in sports, school, and community activities. Application forms are available from the guidance counsellor at all P.E.I. senior high schools. The deadline for receiving applications is August 20.

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 program, the remaining scholarship(s) are offered to a student (or students) entering the second and, if necessary, subsequent years with the highest average (or averages). No application is required. The scholarships are presented at Autumn Assembly.

Nova Scotia Institute of Agrologists Scholarship

The Nova Scotia Institute of Agrologists has provided a scholarship of \$1,000 for a resident of Nova Scotia entering one of the degree programs at the Nova Scotia Agricultural College. In awarding 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 program. 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 programs 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.

Scholarships and Bursaries

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.

The Benny Duivenvoorden Memorial Scholarship

The Benny Duivenvoorden Memorial Scholarship of \$500 is offered by the Eastern Breeders Inc. Atlantic Branch to a New Brunswick 4-H member who enters a recognized college of agriculture. Applications must be made to the N.B. Central A.B. Co-op, Box 1567, Fredericton, New Brunswick E3B 5H1. The deadline for applications to be received at this address is August 31.

Co-op Atlantic Bursaries

Co-op Atlantic offers three bursaries of \$500 each to students entering the technician program. Selection is based on the recommendation of a local 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 programs with averages in the work of the previous year at NSAC of 75% or higher.

\$1,500 is awarded to all these students with averages in the work of the previous year of 80% or higher and with no failed subjects.

\$750 is awarded to all these students with averages in the work of the previous year of 75% to 80% and with no failed subjects.

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 \$500 to all NSAC students who are residents of Nova Scotia and who are admitted for their second or third year of the technical programs with averages in the work of the previous year at NSAC of 80% or higher and with no failed subjects.

Scholarships and Bursaries

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.) program. 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.

Nova Scotia Veterinary Medical Association Bursaries

The Nova Scotia Veterinary Medical Association provides two bursaries of \$500 each to two students based on financial need, who have successfully completed the second year of the Animal Health Technology program and who are continuing into the third year of the program.

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 program who has satisfactorily passed the first academic year and has entered the second year of studies. Only students who intend to farm will be considered. The selection of the recipient by the Scholarships Committee of NSAC will be based upon leadership qualities within the college community, combined with a desirable scholastic standing. The presentation of this scholarship takes place at the Autumn Assembly. Application forms are available from the Registrar's Office, NSAC. The deadline for receiving applications is September 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 program and is entering the second year; the other is awarded to a student who has completed the work of the first year of the technician program and is entering the second year of that program. Financial need and academic standing are considered in making the award. No application is necessary.

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

Scholarships and Bursaries

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 program. The scholarship is awarded on the basis of scholastic standing, need, and participation in 4-H Club activities. A letter of application indicating 4-H experience must be received at the Registrar's Office, NSAC, not later than September 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 programs. 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 program at NSAC who is admitted to the Atlantic Veterinary College or other similar Canadian veterinary college.

Scholarships and Bursaries

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.

Kings County Federation of Agriculture Bursary

A \$500 bursary is offered to a resident of Kings County, N.S. enrolled in a full-time program of study at the NSAC. The award will be based on financial need, academic achievement, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the executive or a committee of the K.C.F.A. Applications should be received by the Kings County Federation of Agriculture, P.O. Box 185, Port Williams, N.S. B0P 1T0 before June 30.

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 program at the Nova Scotia Agricultural College and who enter the second year of the program. Application forms can be obtained from the office of the New Brunswick Sheep Breeders Association or from the Registrar's Office, NSAC. The deadline for applications to be 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 program. 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.

Scholarships and Bursaries

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.

Atlantic Farm Mechanization Show Scholarship

The Atlantic Farm Mechanization Show offers a scholarship(s) of approximately \$1,000 total value, to students from the Atlantic Provinces who have completed at least one year of studies at the College, and who are currently enrolled in a degree or technical program of Engineering, Mechanization or Farm Equipment.

The awarding of the scholarship(s) is based on academic achievement and demonstrated potential for a career in the area of mechanization of agriculture. The award is made on the recommendation of the Agricultural Engineering Department. No application is necessary.

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.

Canadian Society for Horticultural Science Scholarship

A scholarship of \$250 is granted annually to two students enrolled in a Canadian diploma program which 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.

Masterfeeds Scholarship

Masterfeeds, a division of Robin Hood Multifoods Inc., offers a \$1,000 scholarship to a Newfoundland student entering the second year of a business and economics program. The scholarship is to encourage students to consider a career in sales and technical service in private industry. Where there is not a suitable business

Scholarships and Bursaries

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 Committee 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.

H.A.L. MacLaughlin Memorial Scholarship

The income derived from a trust fund established by the MacLaughlin family will be awarded annually as a scholarship to a student in horticulture. An academic standing of at least 70% is the minimum requirement. The recipient is chosen annually by the Principal of the NSAC. No application form is necessary.

Chicken Producers Association of Nova Scotia Scholarship

The Chicken Producers Association of Nova Scotia will award a \$1,000 scholarship to an NSAC student in any year of study in either a degree or diploma program. Applicants must be residents of Nova Scotia and show a demonstrated interest in pursuing the study of poultry. Qualified students with a farm background are especially encouraged to apply. Letters of application should be sent to: Secretary, Chicken Producers Association of Nova Scotia, Kentville, N.S. B4N 1J5 by September 1.

Atlantic Land Improvement Contractors Association Scholarship

An annual scholarship of \$500 has been established by the Atlantic Land Improvement Contractors Association. The scholarship is available to degree Agricultural Engineering students with a demonstrated ability and interest in soil, water, and land improvement. The selection of a recipient is by the Scholarship Committee in consultation with the Agricultural Engineering Department.

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.) program and has registered for the final year. The student may also be offered an internship with the company for the summer period between the third and fourth academic years.

Scholarships and Bursaries

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

Scholarships and Bursaries

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.

Angus and Tena MacLellan Memorial Scholarship

A bequest from Angus and Tena MacLellan who farmed in Cloverville, Antigonish County, Nova Scotia, provides a \$1,000 scholarship for a student entering the third or fourth year of a degree program. The recipient is to be selected by the Scholarship Committee.

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 program. 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.

Scholarships and Bursaries

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 program 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 qualified resident of New Brunswick. The selection of the recipients will be based on academic standing, interest in the Maritime potato industry, and potato farm experience or background. If no suitable candidates apply, the scholarships will not be awarded for that academic year. A letter of application must be received by the 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 silver Governor-General's Medal is awarded annually to the student in the degree programs who achieves the highest academic standing in the graduating class.

A bronze Governor-General's Medal is awarded annually to the student in the technical programs who achieves the highest academic standing in the graduating class.

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 program.

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.



**Nova Scotia
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