

**Calendar 1995-1996**

# **Your Future is Here**

**Nova Scotia Agricultural College**



**Serving Atlantic Canada**



---

# **Your Future Is Here**

## **Nova Scotia Agricultural College**

**Ninetieth Annual Calendar**

# **1995–1996**

### **Mailing Address**

Office of the Registrar  
Nova Scotia Agricultural College  
P.O. Box 550  
Truro, Nova Scotia  
Canada B2N 5E3

Telephone: (902) 893-6722, 893-6723

FAX: (902) 895-5529

*The Nova Scotia Agricultural College reserves the right to make changes to this calendar without notice.*

---







# Contents

<b>Academic Calendar 1995–1996</b> .....	<b>7</b>
<b>Officers of Administration</b> .....	<b>8</b>
<b>Faculty</b> .....	<b>9</b>
<b>Schedule of Payments</b> .....	<b>16</b>
Deposits .....	16
Payments at Registration .....	17
Undergraduate Programs .....	17
Graduate Programs .....	18
Technician and Technology Programs .....	18
Pre-Tech Semester .....	18
Individual Course (Part-Time Students) .....	19
Refund of Fees .....	19
Residence Accommodations .....	20
Caution and Laboratory Deposit .....	20
Canada Student Loans Program .....	21
<b>General Information</b> .....	<b>22</b>
Programs Offered .....	22
Facilities .....	23
Post Office Address .....	23
Telephone .....	23
College Colours .....	23
Churches .....	24
Health Services .....	24
Day Care .....	24
Student Services .....	24
Career Services .....	24
Student Government .....	25
Athletics .....	25
<b>Regulations</b> .....	<b>26</b>
General Regulations .....	26
Residence Regulations .....	26
Medical .....	27
Athletic Regulations .....	27



<b>Summary of Academic Programs</b> .....	<b>28</b>
Agricultural Science .....	28
Engineering .....	28
Environmental Engineering .....	28
Pre-Veterinary Medicine .....	28
Master of Science in Agriculture .....	28
Technician Programs .....	29
Technology Programs .....	29
Seminar Program .....	29
Vocational Courses .....	29
<b>Mission Statements</b> .....	<b>30</b>
Undergraduate Degree Program Mission Statement .....	30
Technical Program Mission Statement .....	30
<b>Explanation of Terms and Codes</b> .....	<b>31</b>
Category Codes—B.Sc. (Agr.) Program .....	32
<b>Challenge for Credit</b> .....	<b>32</b>
Procedures .....	32
<b>Undergraduate Degree Programs</b> .....	<b>34</b>
Professional Organizations for Agrologists and Engineers .....	35
Academic Standing .....	35
Entrance Requirements .....	36
Supplemental Examinations .....	36
Bachelor of Science in Agriculture—B.Sc. (Agr.) .....	37
Minimum Requirements .....	37
Syllabus (Year 1) .....	38
Syllabus (Agribiology—Environmental Biology) .....	38
Syllabus (Agribiology—Pest Management) .....	39
Syllabus (Agricultural Chemistry) .....	40
Syllabus (Agricultural Economics) .....	41
Syllabus (Agricultural Mechanization) .....	42
Syllabus (Animal Science) .....	43
Syllabus (Aquaculture) .....	44
Syllabus (Plant Science) .....	45
Syllabus (Soil Science) .....	46
Agricultural Engineering in Atlantic Canada—B.Eng. ....	47
Engineering Diploma .....	47
Requirements .....	47
Syllabus (Agricultural Engineering Diploma) .....	48



Environmental Engineering Diploma . . . . .	49
Syllabus (Environmental Engineering Diploma) . . . . .	49
Pre-Veterinary Medicine . . . . .	51
Requirements . . . . .	51
Syllabus . . . . .	52
<b>Graduate Programs . . . . .</b>	<b>53</b>
Master of Science in Agriculture . . . . .	53
<b>Technician Programs . . . . .</b>	<b>55</b>
Pre-Tech Semester . . . . .	55
Entrance Requirements . . . . .	55
Academic Standing . . . . .	56
Supplemental Examinations . . . . .	56
Agricultural Colleges Exchange Program . . . . .	56
Agricultural Business . . . . .	57
Academic Entrance Requirements . . . . .	57
Syllabus . . . . .	57
Agricultural Engineering . . . . .	59
Academic Entrance Requirements . . . . .	59
Syllabus . . . . .	59
Animal Science . . . . .	60
Academic Entrance Requirements . . . . .	60
Syllabus . . . . .	60
Plant Science . . . . .	61
Academic Entrance Requirements . . . . .	61
Syllabus . . . . .	62
<b>Diploma of Technology Programs . . . . .</b>	<b>64</b>
Supplemental Examinations . . . . .	64
Animal Health Technology . . . . .	65
Academic Entrance Requirements . . . . .	65
Syllabus . . . . .	65
Biology Technology . . . . .	66
Academic Entrance Requirements . . . . .	66
Syllabus . . . . .	66
Chemistry Laboratory Technology . . . . .	67
Academic Entrance Requirements . . . . .	67
Syllabus . . . . .	67
Food Quality Technology . . . . .	68
Academic Entrance Requirements . . . . .	68
Syllabus . . . . .	68



Landscape Horticulture Technology . . . . .	69
Academic Entrance Requirements . . . . .	69
Syllabus . . . . .	70
<b>Technology Programs Entered from Technician Programs . . . . .</b>	<b>70</b>
Supplemental Examinations . . . . .	70
Agricultural Technology . . . . .	71
Farming Technology . . . . .	71
Entrance Requirements . . . . .	72
Syllabus . . . . .	72
<b>Technical and Undergraduate Courses . . . . .</b>	<b>74</b>
Agricultural Engineering . . . . .	74
Animal Science . . . . .	86
Biology . . . . .	103
Chemistry and Soil Science . . . . .	113
Economics and Business . . . . .	126
Humanities . . . . .	135
Interdepartmental . . . . .	143
Mathematics and Physics . . . . .	144
Plant Science . . . . .	149
<b>Graduate Courses . . . . .</b>	<b>162</b>
<b>Vocational Courses . . . . .</b>	<b>171</b>
<b>Scholarships, Bursaries and Prizes . . . . .</b>	<b>173</b>
Definition of Terms . . . . .	173
Entrance Scholarships and Bursaries . . . . .	173
Continuation Scholarships and Bursaries . . . . .	178
For Degree Students . . . . .	178
For Technical Students . . . . .	186
Medals and Prizes . . . . .	191
Scholarships and Bursaries for Continuing Studies beyond the B.Sc. (Agr.) and Technical Level . . . . .	193
External Scholarships and Bursaries . . . . .	195
Other Entrance Scholarships . . . . .	195
Other Continuing Scholarships . . . . .	195



## **Academic Calendar 1995–1996**

### **1995**

August	24, 25	Early registration.
September	7	Registration for first-time students.
September	8	Registration for returning students.
September	11	Fall Semester classes begin.
October	9	Thanksgiving. No classes.
October	25	Autumn Assembly.
December	1	Last day of classes, Fall Semester.
December	4–14	Fall Semester examinations.

### **1996**

January	2	Registration for first-time students.
January	3	Winter Semester classes begin.
February	19–23	Mid-semester break for individual study.
April	4	Last day of classes, Winter Semester.
April	8–18	Winter Semester examinations.
May	3	Convocation.



## **Officers of Administration**

### **Principal**

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

### **Principal Emeritus**

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

### **Vice-Principal Academic**

To be appointed

### **Vice-Principal Administration**

B.M. MacDonald, B.Sc., M.Sc. (Maine), Ed.D. (West Virginia)

### **Registrar**

T.L. Dolhanty, B.A. (Lethbridge)

### **Assistant Registrar**

Ms. Lynn Sibley

### **Dean of Student Services**

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

### **Assistant Dean of Student Services— Career Services and Awards**

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

### **Coordinator of Research & Graduate Studies**

W.M. Connors-Beckett, B.B.A. (Mt. St. Vincent)

### **Chief Librarian**

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

### **Director of Athletics (Acting)**

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

### **Director of Continuing Education**

To be appointed

### **Director of International Development**

To be appointed

### **Business Manager**

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

### **Manager, Information Technology**

To be appointed

### **Alumni Coordinator**

A.M. Thibodeau, B.A. (Mt. Allison)

### **Administrative Secretary**

Mrs. Ruby MacKay



## **Faculty**

### **Principal**

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

### **Agricultural Engineering**

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

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

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

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

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

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

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

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

### **Animal Science**

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

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



---

*Nova Scotia Agricultural College Calendar 1995–1996*

E. Charmley, B.Sc. (Aberdeen), Ph.D. (Reading)  
Adjunct Professor

A.H. Farid, B.Sc., 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

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

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

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

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

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

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

K.I. Rouvinen, B.Sc., M.Sc., Ph.D. (Kuopio)  
Chair in Fur Animal Research

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

A.B. Webster, B.Sc. (McGill), M.Sc., Ph.D. (Guelph)  
Adjunct Professor



## **Biology**

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

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

D.J. Doohan, B.Sc. (Agr.) (Guelph), M.Sc., Ph.D. (N.C. State)  
Adjunct Professor (jointly with the Plant Science Department)

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

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

C.R. Lacroix, B.Sc., M.Sc. (McGill), Ph.D. (Guelph)  
Adjunct Professor

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

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

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

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

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

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

## **Chemistry and Soil Science**

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

---



---

*Nova Scotia Agricultural College Calendar 1995-1996*

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

M.R. Carter, B.Sc. (Agr.), M.Sc. (Alberta), Ph.D. (Saskatchewan)  
Adjunct Professor

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

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

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

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

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

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

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

**Economics and Business Management**

S.G. Russell, B.Sc. (Agr.) (Guelph), M.B.A. (St. Mary's)  
Associate Professor and Head

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

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

D.M. Dunlop, B.Sc. (Agr.) (Nova Scotia Agricultural College), M.Sc. (Alberta)  
Lecturer

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

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

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

M.P. Whalen, B.Sc. (St. Mary's), M.B.A. (Dalhousie)  
Chair of Marketing

### **Humanities**

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

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

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

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

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

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

### **Mathematics and Physics**

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

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

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



K. MacRae, B.Ed. (British Columbia), M.Sc., Ph.D. (Oregon)  
Adjunct Professor

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

### **Plant Science**

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

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

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

G. Belanger, B.Sc.A. (Laval), M.Sc. (Guelph), Ph.D. (Paris-Sud)  
Adjunct Professor

B.R. Christie, B.S.A., M.S.A. (Toronto), Ph.D. (Iowa)  
Adjunct Professor

O.W.K. Coleman, B.A., Ph.D. (Western Ontario)  
Honorary Research Associate

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

D.J. Doohan, B.Sc. (Agr.) (Guelph), M.Sc., Ph.D. (N.C. State)  
Adjunct Professor (Jointly with the Biology Department)

C.G. Embree, B.Sc. (Agr.) (O.A.C.), M.Sc. (British Columbia)  
Adjunct Professor

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

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

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

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

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

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

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

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

R.K. Prange, B.Sc. (Acadia), M.Sc. (British Columbia), Ph.D. (Guelph)  
Honorary Research Associate

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

J.M. Wright, B.Sc. (Mount Allison), Ph.D. (Memorial)  
Honorary Research Associate



## **Schedule of Payments**

### **Deposits**

In the letter that offers acceptance the student is asked to forward to the Registrar's Office a \$100 program registration deposit and, for students who want a place in residence, a \$125 room deposit. The receipt for \$225 confirms the student's acceptance of the offer of admission, assures the student of a place in the program, and reserves a place for the student in residence. The receipt of the \$100 program deposit, only, confirms the student's acceptance of the offer of admission, assures the student's place in the program, and indicates that the student does not want to have a place reserved in residence. The full amount of the program deposit will be refunded when students cancel their applications before July 30. After this date, there is no refund of the \$100 program deposit. The \$125 residence deposit will be refunded up to but not after June 1 for returning students and up to but not after June 30 for new students. (Residence deposits received from students accepted after June 30, 1995 are non-refundable.)

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

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

### **Payments at Registration**

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

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

Students who are not Canadian citizens or residents pay an additional tuition fee of \$850 per semester and must take out health insurance at a cost of approximately \$675 per academic year.

All payments are due on the dates stated.

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

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

## **Undergraduate Programs**

*All charges are subject to change.* The fees below are those in effect in **1994–95**. The fee schedule for 1995–96 will be available early in 1995. Tuition fees for foreign students who are non-sponsored are an additional \$1700 (\$850 per semester). Part-time foreign students pay a prorated fee.

### **Fall Semester Payment**

Tuition	\$1075
Student Union	85
Athletics	45
Medical Insurance (Non-Canadians)	675
Medical Insurance (Canadians)	95
Caution and Laboratory Deposit	\$55
Books (estimated)	400
Residence Accommodation & Meals (Shared)	1930
Residence Accommodation & Meals (Single)	2110
Residence Accommodation & Meals (Large Single)	2280
Laundry Fee	20
House Fee	30

### **Winter Semester Payment**

Tuition	\$1075
Residence Accommodation & Meals (Shared)	2065
Residence Accommodation & Meals (Single)	2245
Residence Accommodation & Meals (Large Single)	2435
Laundry Fee	20
Books (estimated)	400

## **Graduate Programs**

*All charges are subject to change.* The fees below are those in effect in **1994–95**. The fee schedule for 1995–96 will be available early in 1995. Tuition fees for foreign students who are non-sponsored are an additional \$1700 (\$850 per semester). Part-time foreign students pay a prorated fee.

### **Fall Semester Payment**

Tuition	\$1680
Student Union	85
Athletics	45
Medical Insurance (Non-Canadians)	675
Medical Insurance (Canadians)	95
Caution and Laboratory Deposit	55



### Winter Semester Payment

Tuition	\$1680
---------	--------

### Technician and Technology Programs

*All charges are subject to change.* The fees below are those in effect in **1994-95**. The fee schedule for 1995-96 will be available early in 1995. Tuition fees for foreign students who are non-sponsored are an additional \$1700 (\$850 per semester). Part-time foreign students pay a prorated fee.

### Fall Semester Payment

Tuition	\$470
Student Union	85
Athletics	45
Medical Insurance (Non-Canadians)	675
Medical Insurance (Canadians)	95
Caution and Laboratory Deposit	55
Residence Accommodation & Meals (Shared)	1930
Residence Accommodation & Meals (Single)	2110
Residence Accommodation & Meals (Large Single)	\$2280
Laundry Fee	20
House Fee	30
Books (estimated)	400

### Winter Semester Payment

Tuition	\$470
Residence Accommodation & Meals (Shared)	2065
Residence Accommodation & Meals (Single)	2245
Residence Accommodation & Meals (Large Single)	2435
Laundry Fee	20
Books (estimated)	400

### Pre-Tech Semester

Tuition	\$470
Residence Accommodation & Meals (Shared)	2065
Residence Accommodation & Meals (Single)	2245
Residence Accommodation & Meals (Large Single)	2435
Laundry Fee	20
Books (estimated)	400
Student Union, Athletics, etc.	100

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

University	\$300
Technical	135
University Audit	60
Technical Audit	35
Part-time foreign students pay a prorated fee	

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

**Part-Time Fees:** \$300 per course for university courses (course numbers 100 or higher) and \$135 per course for those with course numbers below 100, to a maximum of \$1075 per semester if university courses are included or \$470 per semester if no university courses are included.

### **Refund of Fees**

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

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

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

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

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

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

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



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

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

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

## **Residence Accommodations**

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

- no later than June 1 for returning students
- no later than June 30 for new students
- deposits received after June 30 are not refundable

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

- on September 7 after 1:00 p.m. for all new students
- on September 8 after 1:00 p.m. for all other students

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

## **Caution and Laboratory Deposit**

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

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

All caution deposits are subject to a general levy through the office of the Dean of Student Services 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.

### **Canada Student Loans Program**

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

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

Application forms are available as follows:

Nova Scotia students	Department of Education Box 2290, Halifax Central, Halifax, NS B3J 3C8
----------------------	--

New Brunswick students	Department of Advanced Education and Labour Box 6000, Fredericton, NB E3B 5H1
------------------------	--

Prince Edward Island students	Department of Education Box 2000, Charlottetown, PE C1A 7N8
-------------------------------	---

Newfoundland students	Department of Education Student Aid Division St. John's, NF 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.



## **General Information**

### **Programs Offered**

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

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

Students in the B.Sc. (Agr.) program select one of eight options after the completion of the first year of the program: Agribiology: Environmental Biology; Agribiology: Pest Management; Agricultural Chemistry; Agricultural Economics; Agricultural Mechanization; Animal Science; Plant Science; and Soil Science. The degree is conferred by Dalhousie University in association with NSAC.

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

Students completing 22 specified courses of the Engineering degree program may complete their professional engineering program after a further three years in any engineering discipline at the Technical University of Nova Scotia or may apply to any other institution. Students completing 27 specified courses of the TUNS-NSAC cooperative Environmental Engineering Degree program may complete their professional engineering program in four academic semesters at the Technical University of Nova Scotia.

Two-year programs leading to Technician Diplomas are offered in Agricultural Business, Agricultural Engineering, Animal Science, 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 Agriculture, Animal Health, Biology, Chemistry Laboratory, Farming, Food Laboratory, and Landscape Horticulture.

The Nova Scotia Agricultural College via a unique cooperation with Dalhousie University offers a Master of Science in Agriculture Program. The Master of Science degree is granted by Dalhousie

University in association with the Nova Scotia Agricultural College, the only educational institution in the Atlantic Region with the faculty and facilities capable of providing such a program of study. Through a similar affiliation, students may obtain a Ph.D. in Biology from Dalhousie University. NSAC may also host graduate students registered at other acceptable universities.

The various programs for the 1995–96 college year are listed and described in this calendar. The Faculty reserves the right to make any necessary revisions and additions.

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

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

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

## **Facilities**

The Nova Scotia Agricultural College is located on a 165-hectare property at Bible Hill, a kilometre northeast of Truro, Nova Scotia. The record of the College's graduates in the past 90 years is conclusive evidence that students obtain a sound agricultural education in the programs offered.

The College buildings—Cumming Hall, Harlow Institute, Banting Building, MacRae Library, Langille Athletic Centre, Collins Horticultural Building, Cox Institute of Agricultural Technology, Boulden Building, Hancock Veterinary Building, Animal Science Building, MacMillan Show Centre, and a modern farm building complex—provide excellent teaching and research facilities, as well as offices and laboratories for faculty and staff, and for some 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, NS B2N 5E3

## **Telephone**

Registrar's Office: (902) 893-6723

## **College Colours**

Royal Blue and Regular Gold



## **Churches**

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

## **Health Services**

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

Canadian students who do not provide evidence of acceptable insurance coverage will be required to purchase the plan recommended by the College at a cost of approximately \$95.

International students are required to have a sickness and accident coverage policy made available through the College or by another acceptable arrangement. The cost of medical accident insurance for non-Canadian students is approximately \$675.

## **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. A reduced rate is available for the children of students. Five subsidized spaces are also funded by the Department of Community Services. These spaces are available only to students whose income falls below a certain level. Remember to reserve early to ensure a space in September. 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 career services.

## **Career Services**

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

Career Services 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 Career Services.

## **Student Government**

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

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

## **Athletics**

**Recreational activities.** The Langille Athletic Centre provides an opportunity for students to choose a number of activities to enjoy during their leisure time. Racquetball, squash, and badminton are very popular racquet games. The spacious facility includes a power lifting room with free weights and a number of specific benches for the serious lifter. A new fitness and muscle toning room contains individual weight machines, stair climbers, bikes, rowing machines, and other equipment for the individual who wants to maintain a level of fitness. Swimming, tennis, golf and curling facilities are also available, off campus, to students during the academic year.

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

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

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

## **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.

Students requesting a deferred final examination based on medical reasons must present, to the Registrar, appropriate documentation by a medical doctor.

Tampering with fire protection equipment is forbidden.

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

Every student is expected to show, both within and outside the College, such respect for order, morality, and the rights of others, and such sense of personal honour, as is demanded of good citizens. Students found guilty of immoral, dishonest, or improper conduct, violation of rules, or failure to make satisfactory progress shall be liable to College discipline. Students should make themselves familiar with detailed regulations and procedures, which are published in the *NSAC Student Handbook Community Standards and Residence Handbook*.

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

### **Residence Regulations**

Residence Regulations are to be found in the *NSAC Student Handbook Community Standards and Residence Handbook*, which is distributed to all students.



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

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

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

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

## **Medical**

Each candidate who is accepted will be sent a medical form. 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 they will be allowed to return to the College.

## **Athletic Regulations**

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

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

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



## **Summary of Academic Programs**

### **Agricultural Science**

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

### **Engineering**

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

### **Environmental Engineering**

This five-year co-op program is administered jointly by TUNS and NSAC, and consists of five academic terms at NSAC, four academic terms at TUNS and three work terms. Students enter the first year of the Agricultural Science, Engineering, or Pre-Vet programs and begin their specific courses in year two.

### **Pre-Veterinary Medicine**

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

### **Master of Science in Agriculture**

Formally approved in the spring of 1993, the Master of Science in Agriculture represents a unique co-operation between Dalhousie University and the Nova Scotia Agricultural College. The Master of Science degree is granted by Dalhousie University in association with the Nova Scotia Agricultural College, the only educational institution in the Atlantic Region with the faculty and facilities capable of providing such a program of study.

Graduate students attend classes at the Nova Scotia Agricultural College and, on occasion, supplement their program with courses at Dalhousie University or other recognized institutions. Students may choose to concentrate their studies in any of the following areas: Agribiology, Agricultural Chemistry, Animal Science, Plant Science, and Soil Science.

## **Technician Programs**

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

## **Technology Programs**

Seven programs are offered that lead to Diplomas of Technology.

Animal Health Technology, Biology Technology, and Food Laboratory Technology are three-year programs. The Chemistry Laboratory Technology and Landscape Horticulture Technology programs are two years in duration.

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

## **Seminar Program**

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

## **Vocational Courses**

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



## **Mission Statements**

### **Undergraduate Degree Program Mission Statement**

Undergraduate education at the Nova Scotia Agricultural College seeks to provide students with a knowledge of science and its application to agriculture. The College assists students to achieve an understanding of agriculture in the regional and global contexts, as well as expertise in their chosen disciplines. Students are also encouraged to develop a wider view of the world through exposure to the humanities.

The Nova Scotia Agricultural College assists students in acquiring the skills they will need to work effectively and learn independently throughout their lives. At all stages of the undergraduate program the faculty stimulates students to think critically, logically, and quantitatively, and to develop skills in writing and speaking. The program of study also provides students with the opportunity to learn new technologies, and to acquire the skills needed to deal with technological change.

The Nova Scotia Agricultural College encourages undergraduate students to develop values that will serve as a foundation for continued personal growth. These values include a love of learning, respect for the ideas and values of others, and a sense of responsibility to the broader community.

### **Technical Program Mission Statement**

Technical education and training at the Nova Scotia Agricultural College provides people with the knowledge and practical skills required for the workplace. Emphasis is placed on the application of the principles of science, engineering, and business to the performance of technical tasks in employment situations. The technical program fosters critical thinking, communication skills, and an application of the professional requirements of the workplace.

Being employment-directed, the technical program provides up-to-date training for a range of career opportunities and promotes a lifelong interest in maintaining and improving technical competence.



## **Explanation of Terms and Codes**

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

All Disciplines (Graduate)	<b>AG</b>	Economics and Business	<b>EB</b>
Agricultural Engineering	<b>AE</b>	Humanities	<b>H</b>
Animal Science	<b>AS</b>	Interdepartmental	<b>IN</b>
Biology	<b>B</b>	Mathematics and Physics	<b>MP</b>
Chemistry-Soils	<b>CS</b>	Plant Science	<b>PS</b>

Only courses with numbers of 100 or over are degree credits. Most courses with numbers between 100 and 199, inclusive, are part of the first year of the curriculum; and numbers 200 to 299 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 Soil Science subject that is usually offered in the first year of the technician program, while PS49 is a Plant Science course that is offered in the second year of the technician program.

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

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

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

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

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

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

The following are the categories and their codes:

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

## **Challenge for Credit**

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

### **Procedures**

Application for Challenge for Credit is made to the Registrar.

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

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

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

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

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

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

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

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

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

A maximum of 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.



## **Undergraduate 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 two years of a five-year program in various engineering disciplines, and a two-year pre-veterinary program are also offered.

Students in the B.Sc. (Agr.) program begin to specialize in their second year. They choose from a variety of options. The eight options available at NSAC are Agribiology: Environmental Biology; Agribiology: Pest Management; Agricultural Chemistry; Agricultural Economics; Agricultural Mechanization; Animal Science; Plant Science; and Soil Science. A ninth program in Aquaculture has been approved but the introduction of the program depends on funding. 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.

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

The Pre-Vet program also serves as the first two years of the B.Sc. (Agr.) program, Animal Science option. Transfer to other options of the B.Sc. (Agr.) program is possible, but 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.).

NSAC students who complete the first year of the B.Sc. (Agr.), Engineering, or Pre-Veterinary Medicine programs, may begin to specialize in Environmental Engineering in their second year. This is a co-op program, administered jointly by NSAC and TUNS. Graduates of the five semester NSAC Environmental Engineering Diploma program are admitted to TUNS where they complete their Professional Engineering Degree with speciality in Environmental Engineering in the Department of 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. Students in Environmental Engineering who successfully complete the prescribed courses and have attained the required cumulative grade average are granted a Diploma in Environmental Engineering.

A high honours diploma will be awarded all graduates of degree programs who have taken 20 or

more courses at NSAC and have achieved a cumulative average of 80% or better. An honours diploma will be awarded to graduates achieving a cumulative average of between 75% and 80%.

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

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

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

## **Academic Standing**

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

Students who attain cumulative grade averages below the following levels, and who are not required to withdraw, will be on academic 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) to the minimum level, or do not achieve semester grade averages (SGA) of 60 or above, will be required to withdraw.



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

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

## **Entrance Requirements**

All candidates for admission to the program leading to a B.Sc. (Agr.) and the Pre-Vet program must present high school graduation certificates showing an average of at least 60%, with no mark below 50%, in Grade XII (Nova Scotia 441, New Brunswick 121 or 122, Prince Edward Island university preparatory), English, Mathematics (70% in Math 442 acceptable), 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. **Possession of the minimum entrance requirements does not guarantee admission.**

All candidates for admission to 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, New Brunswick 121 or 122, Prince Edward Island university preparatory), English, Mathematics (70% in Math 442 acceptable), Chemistry, Physics, and one other subject, preferably Biology. **Possession of the minimum entrance requirements does not guarantee admission.**

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

## **Supplemental Examinations**

A student may write one supplemental examination in each failed subject in which the mark is 40% to 49%. The supplemental examination (or examinations) are written in the June supplemental examination period immediately following the failure. A student in the final year may write one supplemental examination in a Fall semester course, 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 examinations.

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

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

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

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

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

### **Minimum Requirements**

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

- all courses as specified in the syllabus
- not less than 12 semester courses in Agricultural Science or Agricultural Engineering
- not less than 6 semester courses in Basic Sciences
- not less than 6 semester courses in Humanities and Economics (one Humanities course must be at the 300 or 400 level)
- at least 40 semester courses
- at least 15 courses at NSAC and registration in the final year at NSAC
- courses with numbers of 100 or higher are degree credits
- **IN100 and IN101 each count as two semester courses**



The minimum level of academic achievement to graduate is a cumulative grade average of 60%. It is the student's responsibility to see that the requirements for the awarding of the B.Sc. (Agr.) are fulfilled.

## **Bachelor of Science in Agriculture—Syllabus**

### **Year 1—All Options**

---

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

B100	Botany
CS100	Chemical Principles
IN100	Agriculture and Food I
H102	Nature in English and American Literature <i>or</i>
H160	Introductory Sociology <i>or</i>
MP100	Calculus and Analytic Geometry I

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

B110	Zoology
CS110	Organic Chemistry
IN101	Agriculture and Food II
H101	The English and American Novel <i>or</i>
H170	Introductory Human Geography <i>or</i>
MP100	Calculus and Analytic Geometry I

*Students must complete MP100 and one of H101, H102, H160, or H170.*

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

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

---

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

B200	Cell Biology
B265	Systematic Botany
CS200	Biochemistry I
MP130	Physics for Life Sciences I <i>Elective</i>

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

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

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

AS300	Animal Physiology
B330	Ecology
B350	Ecological Methods
B360	Environmental Analysis <i>Elective</i>

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

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

---

**Years 2, 3 and 4—Agronomy: Environmental Biology (Cont'd)**


---

**Semester VII**

B240	Genetics I
B385	Principles of Pest Management
B400	Soil Microbiology
B449	Project-Seminar I
	<i>Elective</i>

**Semester VIII**

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

*Electives must include one of either H320 or H350, and one additional Humanities or Economics course.*

**Recommended Electives:****Fall Semester**

AE340	Soil and Water
MP320	Statistical Methods

**Winter Semester**

AE410	Water & Water Quality Management
B405	Pesticides in Agriculture
B430	Ecology of Agriculture
CS320	Soil Fertility
MP330	Agrometeorology
PS350	Plant Biochemistry

---

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


---

**Semester III**

B200	Cell Biology
B265	Systematic Botany
CS200	Biochemistry I
MP130	Physics for Life Sciences I
	<i>Elective</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>

**Semester VI**

B406	Economic Plant Pathology
B425	Economic Entomology
B445	Applied Weed Science
MP222	Computer Methods
	<i>Elective</i>



**Years 2, 3 and 4—Agronomy: Pest Management (Cont'd)**

---

**Semester VII**

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

**Semester VIII**

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

*Electives must include one of H320, H325 or H350, one additional Humanities or Economics course, and one of either B400, B405, or B430.*

**Recommended Electives:**

A crop production course

**Fall Semester**

MP320	Statistical Methods
-------	---------------------

**Winter Semester**

MP330	Agrometeorology
PS350	Plant Biochemistry

**Years 2, 3 and 4—Agricultural Chemistry**

---

**Semester III**

CS200	Biochemistry I
CS210	Advanced General Chemistry <sup>1</sup> <i>or</i>
CS215	Advanced Organic Chemistry <sup>1</sup>
MP130	Physics for Life Sciences I
	<i>Elective</i>
	<i>Elective</i>

**Semester IV**

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

**Semester V**

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

**Semester VI**

B225	Microbiology
CS310	Radiotracers in Agriculture
CS350	Food Chemistry
CS440	Environmental Soil Chemistry <sup>1</sup> <i>or</i>
	<i>Elective</i>
	<i>Elective</i>
	<i>Elective</i>

---

**Years 2, 3 and 4—Agricultural Chemistry (Cont'd)**


---

**Semester VII**

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

**Semester VIII**

CS370	Instrumental Food Analysis
CS440	Environmental Soil Chemistry <sup>1</sup> <i>or</i> <i>Elective</i>
CS450	Project-Seminar II
EB355	Macroeconomics I <i>Elective</i>

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

*Electives must include one Humanities course at the 300 or 400 level, one more Humanities or Economics course and three Agriculture courses.*

**Recommended Electives:****Fall Semester**

AS300	Animal Physiology
AS305	Animal Nutrition
B330	Ecology
B400	Soil Microbiology
CS415	Spec. Topics in Chem. & Soil Sc. I
EB340	Farm Management I
IN400	Issues in Agriculture
PS305	Grain Production
CS420	Organic Environmental Analysis

**Winter Semester**

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

---

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


---

**Semester III**

EB200	Microeconomics I
EB210	Financial Accounting I
EB260	Mathematical Economics
MP222	Computer Methods <i>Elective</i>

**Semester IV**

EB205	Microeconomics II
EB355	Macroeconomics I
MP200	Statistics <i>Elective</i> <i>Elective</i>

**Semester V**

EB340	Farm Management I
EB360	Econometrics
MP130	Physics for Life Sciences I <i>Elective</i> <i>Elective</i>

**Semester VI**

EB320	Agriculture & Food Policy I
EB325	Operations Research
EB330	Agricultural Markets and Prices
EB405	Macroeconomics II <i>Elective</i>

---



---

**Years 2, 3 and 4—Agricultural Economics (Cont'd)**

---

**Semester VII**

EB425 Research Methods  
*Elective*  
*Elective*  
*Elective*  
*Elective*

**Semester VIII**

EB450 Project-Seminar  
*Elective*  
*Elective*  
*Elective*  
*Elective*

*Electives must include four Economics and Business courses of which two must be at the 400 level, one Humanities course at the 300 or 400 level, one basic science course and three Agricultural or Agricultural Engineering courses.*

---

**Years 2, 3 and 4—Agricultural Mechanization**

---

**Semester III**

AE101 Computer Aided Graphics &  
Projection  
EB 210 Financial Accounting  
MP130 Physics for Life Sciences I  
MP105 Calculus & Analytic Geometry II *or*  
*Elective*  
*Elective*

**Semester IV**

AE120 Properties and Mechanics of Materials  
MP200 Statistics  
MP222 Computer Methods  
MP105 Calculus & Analytic Geometry II *or*  
*Elective*  
*Elective*

**Semester V**

AE320 Structures and Their Environment  
AE335 Materials Handling and Processing  
AE355 Principles of Agricultural Machinery  
AE340 Soil and Water  
EB310 Cost Accounting  
*Elective*

**Semester VI**

AE135 Fundamentals of Food Processing  
AE305 Engineering Measurements  
and Controls  
AE449 Project-Seminar I  
*Elective*

**Semester VII**

AE405 Environmental Impacts & Resource  
Management  
AE450 Project-Seminar II  
EB340 Farm Management I  
*Elective*  
*Elective*

**Semester VIII**

AE410 Water & Water Quality  
AE420 Management of Mechanized Agricultural  
Systems  
EB355 Macroeconomics I  
EB440 Farm Management II  
*Elective*

*Electives must include a Humanities course at the 300 or 400 level.*

---

**Years 2, 3 and 4—Agricultural Mechanization (Cont'd)**

**Recommended Electives:**

**Fall Semester**

AE360	Aquatic Engineering
AE415	Directed Studies in Agricultural Engineering
AS205	Introductory Animal Production
B330	Ecology
B335	Weed Science
CS345	Soil Conservation in Agriculture
EB335	Business Marketing
MP320	Statistical Methods
PS200	Vegetable Crops
PS305	Grain Production
PS320	Small Fruit Crops
PS330	Greenhouse Crop Production and Floriculture

**Winter Semester**

AE215	Aquatic Environment
AE415	Directed Studies
B225	Microbiology
PS300	Forage Crops
PS325	Potato Production

**Spring**

AE260	Surveying
-------	-----------

**Years 2, 3 and 4—Animal Science**

**Semester III**

B200	Cell Biology
B240	Genetics I
CS200	Biochemistry I
MP130	Physics for Life Sciences I
	<i>Elective</i>

**Semester IV**

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

**Semester V**

AS300	Animal Physiology
AS305	Animal Nutrition
AS310	Animal Breeding
	<i>Elective</i>
	<i>Elective</i>

**Semester VI**

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

---

**Years 2, 3 and 4—Animal Science (Cont'd)**

---

**Semester VII**

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

**Semester VIII**

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

*Electives must include three Animal Production courses, one Humanities course at the 300 or 400 level, and one more Humanities or Economics course.*

---

**Years 2, 3 and 4—Aquaculture (Subject to Funding)**

---

**Semester III**

AS210 Intro. to Aquaculture  
B200 Cell Biology  
B240 Genetics I  
CS200 Biochemistry I  
MP130 Physics for Life Sciences I

**Semester IV**

AE215 Aquatic Environment  
B225 Microbiology  
CS205 Biochemistry II  
MP200 Statistics  
MP222 Computer Methods

**Semester V**

AS305 Animal Nutrition  
AS310 Animal Breeding  
AS380 Phys. of Aquatic Animals  
EB340 Farm Management I  
*Elective*

**Semester VI**

AS365 Fish Nutrition  
AS370 Fish Health  
AS375 Aquatic Ecology  
AE360 Aquacultural Engineering  
*Elective*

**Semester VII**

AS440 Finfish Production  
AS449 Project-Seminar I  
*Elective*  
*Elective*  
*Elective*

**Semester VIII**

AS445 Shellfish Production  
AS450 Project-Seminar II  
*Elective*  
*Elective*  
*Elective*

*Electives must include one of EB210, EB335, or EB440 and two additional Humanities course, one of which must be at the 300 or 400 level.*



---

**Years 2, 3 and 4—Aquaculture (Cont'd)**


---

**Recommended Electives:****Fall Semester****Winter Semester**

AE410	Water & Water Quality Management
AS325	Applied Animal Nutrition
AS350	Meat Science
CS350	Food Chemistry
CS370	Instrumental Food Analysis

---

**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>Elective</i>
	<i>Elective</i>

**Semester V**

B300	Principles of Plant Pathology
B320	General Entomology
B335	Weed Science
	<i>Elective</i>
	<i>Elective</i>

**Semester VI**

CS320	Soil Fertility
PS449	Plant Science Project-Seminar I
	<i>Elective</i>
	<i>Elective</i>
	<i>Elective</i>

**Semester VII**

PS415	Crop Adaptation
PS450	Plant Science Project-Seminar II
	<i>Elective</i>
	<i>Elective</i>
	<i>Elective</i>

**Semester VIII**

EB355	Macroeconomics I
PS405	Agronomy <i>or</i>
PS410	Horticulture
	<i>Elective</i>
	<i>Elective</i>
	<i>Elective</i>

***Electives must include three crop production courses, one Humanities course at the 300 or 400 level and one additional Humanities or Economics course. It is recommended that at least one crop production elective be taken before the end of Semester IV. Agronomy majors must include PS305 in Semester V and PS300 in Semester VIII.***

**Years 2, 3 and 4—Plant Science (Cont'd)**

---

**Recommended Electives:**

**Fall Semester**

EB340 Farm Management I  
MP222 Computer Methods

**Winter Semester**

B245 Genetics II  
CS205 Biochemistry II  
MP222 Computer Methods  
MP330 Agrometeorology  
PS350 Plant Biochemistry  
PS400 Plant Breeding

**Years 2, 3 and 4—Soil Science**

---

**Semester III**

CS200 Biochemistry I  
MP130 Physics for Life Sciences I  
*Elective*  
*Elective*  
*Elective*

**Semester IV**

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

**Semester V**

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

**Semester VI**

CS230 Introduction to Geology  
CS320 Soil Fertility  
CS335 Soil Physics<sup>1</sup> *or*  
CS440 Environmental Soil Chemistry<sup>1</sup>  
H205 Canadian Studies  
*Elective*

**Semester VII**

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

**Semester VIII**

CS335 Soil Physics<sup>1</sup> *or*  
CS440 Environmental Soil Chemistry<sup>1</sup>  
CS450 Project-Seminar II  
EB355 Macroeconomics I  
*Elective*  
*Elective*

**Electives must include one Humanities at the 300 or 400 level and one more Humanities or Economics course.**

**Years 2, 3 and 4—Soil Science (Cont'd)****Recommended Electives:**

<b>Fall Semester</b>		<b>Winter Semester</b>	
B300	Principles of Plant Pathology	AE345	Energy in Agriculture
B320	General Entomology	CS205	Biochemistry II
B335	Weed Science	CS310	Radiotracers in Agriculture
CS345	Soil Conservation in Agriculture	CS425	Special Topics in Chemistry and Soil Science II
CS415	Special Topics in Chemistry and Soil Science I	H300	History of Agriculture
H305	History of Scientific and Agricultural Thought	H325	Technology in Agricultural Communications
PS147	Farm Woodlot Management	MP330	Agrometeorology
PS200	Vegetable Crops <sup>1</sup>	PS300	Forage Crops <sup>1</sup>
PS305	Grain Production	PS415	Crop Adaptation

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

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

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

**Environmental Engineering** is an option of specialized study within the Agricultural Engineering program administered jointly by TUNS and NSAC. This cooperative program consists of five academic semesters at NSAC followed by four at TUNS.

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

**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.

As TUNS and the Associated Universities form a unified system of engineering education, all diploma graduates from the Associated Universities are guaranteed admission to TUNS. It is not possible, however, for TUNS to guarantee that students will gain entry to the department of their choice since all



departments are subject to a known maximum number of annual admissions. Thus students are required to specify their choice of at least three departments, in preferential order, and at a predetermined date departments will select students for admission, the basis for selection being the academic performance of the applicants.

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 and registration in the final year at NSAC

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

## **Syllabus**

### **Year 1**

---

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

AE101	Computer Aided Graphics & Projection
CS100	Chemical Principles I
H102	Nature in English and American Literature
MP 100	Calculus and Analytic Geometry I
MP130	Physics for Life Sciences I

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

AE110	Statics
CS110	Organic Chemistry
MP105	Calculus and Analytic Geometry II
MP135	Physics for Life Sciences II
	<i>Humanities Elective<sup>2</sup></i>

### **Year 2**

---

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

AE220	Dynamics I
AE310	Thermodynamics
MP220	Computer Science
MP230	Multivariable Calculus
MP300	Electric Circuits
	<i>Humanities Elective</i>

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

AE205	Graphics and Design
AE225	Dynamics II
AE315	Strength of Materials
AE350	Fluid Mechanics
H150	Agriculture Today <sup>1</sup>
MP235	Differential Equations and Linear Algebra

<sup>1</sup>May substitute H140, H325, or H170 if timetable permits.

<sup>2</sup>May substitute Economics elective if timetable permits.

## Environmental Engineering Diploma

This cooperative program is administered jointly by the Technical University of Nova Scotia and NSAC. Graduates of the program receive an Environmental Engineering Diploma and are accepted by TUNS without examination, into the Environmental Engineering option of the Department of Agricultural Engineering.

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

## Requirements

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

- all courses specified in the syllabus of courses
- at least 27 semester courses
- at least 14 courses at NSAC plus registration in the final semester at NSAC

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

## Syllabus (semester numbers include work semesters)

### Year 1

---

#### *Semesters I and II*

Completion of first year of Agricultural Science, Engineering, or Pre-Vet program.

#### *Semester III*

Summer—no requirements

### Year 2

---

#### *Semester IV at NSAC*

AE101 Computer Aided Graphics  
& Projection  
CS200 Biochemistry I  
MP130 Physics for Life Sciences I  
MP220 Computer Science  
*Elective*  
*Humanities Elective*

#### *Semester V at NSAC*

AE110 Statics  
AE205 Graphics and Design  
B225 Microbiology  
*Science Elective*  
*Humanities Elective*  
*Humanities Elective*

---

**Environmental Engineering Diploma (Cont'd)**

---

**Semester VI**

Work term 1\*

**Semester VII at NSAC**

AE220 Dynamics I  
AE310 Thermodynamics  
B330 Ecology  
B360 Environmental Analysis  
MP230 Multivariable Calculus

**Semester VIII at TUNS**

AE0801 Applied Thermodynamics  
AE0805 Electric Circuits and Electronics  
AE0806 Energy and Environment  
AE1240 Biological Waste Management  
IE0718 Engineering Economics  
*Technical Elective*

**Semester IX**

Work term 2\*

**Semester X at TUNS**

AE1001 Thermodynamics  
AM3011 Differential Equations and  
Linear Algebra  
AM3030 Applied Probability and Statistics  
CP0023 Engineering Law and Contracts  
*Technical Elective*  
*Technical Elective*

**Semester XI at TUNS**

AE0700 Measurement and Control  
AE0810 Heat and Mass Transfer  
AE1200 Engineering Systems  
AE1201 Technical Communicatios  
AM3652 Applied Numerical Methods  
AM4931 Mathematical Statistics

**Semester XII**

Work term 3\*

**Semester XIII**

Work term 4\*

**Semester XIV at TUNS**

AE1230 Environmental Control  
AE1420 Soil and Water Conservation  
AE1440 Biological Wastes Disposal and Utilization  
AE1480 Design Project  
*Technical Elective*  
*Technical Elective*

\*Three work terms are required.



**Environmental Engineering Diploma (Cont'd)**

---

***Recommended Electives at NSAC:***

<i>Fall</i>		<i>Winter</i>	
AS300	Animal Physiology	B260	Plant Physiology
H140	Personnel Management	CS230	Introduction to Geology
H160	Introductory Sociology	CS310	Radiotracers in Agriculture
H370	Rural Geography	CS335	Soil Physics
		CS440	Environmental Soil Chemistry
		H140	Personnel Management
		H170	Intro. Human Geography
		H350	Environ. & Agric. Ethics
		H360	Rural Sociology

*Electives must include one Agricultural Engineering course and two Humanities courses, one of which must be at the 300 or 400 level.*

**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.

**Requirements**

The following is the minimum academic requirement for admission to the Atlantic Veterinary College. It is the student's responsibility to ensure the requirements are met. Students should consult the latest University of Prince Edward Island calendar to make sure that there have been no changes. Twenty-one semester courses or equivalent are required. These include:

- Mathematics—two courses including statistics;
- Biology—four courses including Genetics and Microbiology;
- Chemistry—three courses including Organic Chemistry;
- Physics—one course;
- English—two courses including one with emphasis on writing;
- Humanities and Social Sciences—three courses;
- Electives—five from any discipline.

Science courses will normally have a laboratory component.

## Syllabus (recommended)

### Year 1

---

#### *Semester I*

B100	Botany
CS100	Chemical Principles
IN100	Agriculture and Food I
H102	Nature in English and American Literature <i>or</i>
MP100	Calculus and Analytic Geometry I

#### *Semester II*

B110	Zoology
CS110	Organic Chemistry
IN101	Agriculture and Food II
H101	The English and American Novel <i>or</i>
MP100	Calculus and Analytic Geometry I

### Year 2

---

#### *Semester III*

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

#### *Semester IV*

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

*Electives must include at least two Humanities and Social Sciences courses. Two of H101, H102, H205 are required. IN100 and IN101 together count for four semester courses including one Humanities and Social Science course.*

*In Semesters III and IV electives should be considered on the basis of future academic options.*

### *Recommended Electives*

#### *Fall Semester*

B200	Cell Biology
H140	Personnel Management
EB335	Business Marketing
MP105	Calculus and Analytic Geometry II

#### *Winter Semester*

CS205	Biochemistry II
H130	Introductory French
H140	Personnel Management
H150	Agriculture Today

## **Graduate Programs**

### **Master of Science in Agriculture**

Formally approved in the Spring of 1993, the Master of Science in Agriculture represents a unique co-operative agreement between Dalhousie University and the Nova Scotia Agricultural College to provide post-graduate education in agriculture in the Atlantic Region. The Master of Science degree is granted by Dalhousie University in association with the Nova Scotia Agricultural College, the only educational institution in the Atlantic Region with the faculty and facilities capable of providing such a program of study.

Graduate students attend classes at the Nova Scotia Agricultural College and, on occasion, supplement their program with courses at Dalhousie University or other recognized institutions. Students may choose to concentrate their studies in any of the following disciplines and interdisciplines:

<b>Agribiology:</b>	Ecology Environmental Microbiology Pest Management Sexual Reproduction of Angiosperms Waste Management
<b>Agricultural Chemistry:</b>	Agricultural Chemistry Food Science
<b>Animal Science:</b>	Animal Behaviour Animal Management Animal Product Technology Genetics and Breeding Nutrition Physiology
<b>Plant Science:</b>	Crop Breeding Crop Management Crop Physiology Plant Biotechnology
<b>Soil Science:</b>	Geology Nutrient Management Soil Chemistry Soil Fertility Soil Physics

Faculty and resources are also available in Mathematics and Physics, Agricultural Engineering, Agricultural Economics and Rural Sociology.



### **Admission Requirements**

Candidates must hold a Bachelor's Degree from a university of recognized standing with:

- (a) honours or the equivalent of honours standing as granted by Dalhousie University, in the area in which graduate work is to be done. This standing usually results in a one-year residency.
- (b) at least four (4) undergraduate classes, or their equivalent, in the area in which graduate work is to be done, with a GPA of 3.0 or 70%, or (B) average. This standing usually results in a two-year residency.

The program also offers part-time study. Details can be obtained from:

NSAC Graduate Office  
Nova Scotia Agricultural College  
Truro NS  
B2N 5E3  
Phone (902) 893-6360  
FAX (902) 897-9399

### **Start Dates**

Students may choose to begin their Master of Science in Agriculture Program in the Fall (September 1), Winter (January 1), or Spring (May 1) session. The usual start date is **September 1**. Application deadlines are published in the M.Sc. brochure.

### **Curriculum**

All M.Sc. students are required to complete the Communication Skills course (AG570) and the Graduate Module course (AG571), where the student is encouraged to initiate development of the modules in specific areas. A satisfactory thesis embodying contributions to independent research must be presented and defended successfully in a public oral examination. Students are also required to assist in the teaching of at least one undergraduate course.

### **Credits Required for Graduation**

#### ***M.Sc. (1 year)***

- *Ten graduate credits* are required.
- All graduate classes are full credit courses.
- A minimum grade requirement of 70%.
- The thesis may count for a maximum of six credits.

#### ***M.Sc. (2 year)***

- In addition to the requirements for a M.Sc. (1 year), students must complete at least five credits related to their thesis work with a grade of 70% or better. These additional credits may be at the undergraduate or graduate level.

## **Technician Programs**

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

### **Pre-Tech Semester**

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

Candidates may be considered who lack specific subject entrance requirements for the technician programs in up to three subjects. The following is the syllabus of courses for the Pre-Tech semester:

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

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

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

### **Entrance Requirements**

All candidates for admission must:

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

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

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

**Possession of the minimum entrance requirement does not guarantee admission.**

## **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 satisfactorily complete all the program requirements will be awarded Technician Diplomas, and thus become “Associates of the Nova Scotia Agricultural College.”

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

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

## **Supplemental Examinations**

A student 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 June supplemental examination period immediately following the failure. A student in the final year may write one supplemental examination in a Fall semester course, 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 examinations.

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 examination. 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 an applicant does not 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.

## **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

Arrangements may also be made for students who wish to complete a semester of study in Britain.

For more detailed information contact the Registrar at NSAC.

## **Agricultural Business**

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

### **Academic Entrance Requirements**

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

### **Syllabus**

#### **Year 1 Agricultural Business with minor in Animal Science**

##### *Semester I*

CS12	Principles of Soil Science
CS14	Agr. Chemistry
EB10	Accounting
EB12	Macroeconomics
H10	Technical Writing
PS36	Field Crops

#### **Plant Science**

##### *Semester I*

CS12	Principles of Soil Science
CS14	Agr. Chemistry
EB10	Accounting
EB12	Macroeconomics
H10	Technical Writing
PS36	Field Crops

#### **Agricultural Engineering**

##### *Semester I*

AE12	Drafting
CS12	Principles of Soil Science
CS14	Agr. Chemistry
EB10	Accounting
EB12	Macroeconomics
H10	Technical Writing

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

**Year 1 Agricultural Business with minor in  
Animal Science**

**Semester II**

CS13	Soil Management
EB11	App. Acct. & Taxation
EB13	Microeconomics
EB41	Business Law
MP14	Computational Methods
PS37	Field Crops Management

**Plant Science**

**Semester II**

AS30	Animal Science
CS13	Soil Management
EB11	App. Acct. & Taxation
EB13	Microeconomics
MP14	Computational Methods
PS37	Field Crops Management

**Agricultural Engineering**

**Semester II**

AS30	Animal Science
CS13	Soil Management
EB11	App. Acct. & Taxation
EB13	Microeconomics
MP14	Computational Methods
	<i>Humanities Elective</i>

**Year 2**

**Semester III**

AS20	Farm Animal Breeding
AS34	Animal Nutrition
B20	Animal Physiology
EB40	Marketing Practices
EB65	Business Project
EB340	Farm Management I
AS29	<i>Farm Practices (Optional)</i>

**Semester III**

B43	Entomology
EB40	Marketing Practices
EB65	Business Project
EB340	Farm Management I
PS53	Vegetable Production <sup>2</sup> <i>Humanities Elective</i>

**Semester III**

AE30	Farm Machinery <sup>3</sup>
EB40	Marketing Practices
EB65	Business Project
EB340	Farm Management I
MP15	Introductory Physics
PS36	Field Crops

**Semester IV**

AS35	Feeds and Feeding
AS50	Dairy Production <sup>1</sup>
AS51	Beef and Sheep Production <sup>1</sup>
EB42	Applied Farm Management
EB220	Production Economics <i>Humanities Elective</i>

**Semester IV**

B40	Plant Pathology
EB41	Business Law
EB42	Applied Farm Management
EB220	Production Economics
PS49	Potato Production <sup>2</sup>
PS76	Plant Products Physiology

**Semester IV**

AE34	Farm Tractors <sup>3</sup>
AE38	Horticultural Engineering
EB41	Business Law
EB42	Applied Farm Management
EB220	Production Economics
PS37	Field Crop Management

<sup>1</sup>May substitute AS37, AS47, AS48, AS52, AS53, AS55, AS240 if timetable permits.

<sup>2</sup>May substitute PS43 and PS44 if timetable permits.

<sup>3</sup>May substitute AE32 or AE36 if timetable permits.

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

completed the two years with a good study record may apply for acceptance into a one-year program in Agricultural Technology.

## **Agricultural Engineering**

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

### **Academic Entrance Requirements**

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

## **Syllabus**

### **Year 1**

#### *Semester I*

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

#### *Semester II*

AE19	Technical Drawing
AE20	Shopwork Practices
AE27	Welding
MP14	Computational Methods
PS37	Field Crop Management
	<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>
	<i>Elective</i>

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

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



## **Animal Science**

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

### **Academic Entrance Requirements**

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

## **Syllabus**

### **Year 1**

#### **Animal Science with minor in Agricultural Business**

#### **Agricultural Engineering**

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

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

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

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

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

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

AS29 Farm Practices  
AS33 Applied Animal Physiology  
AS35 Feeds and Feeding  
CS13 Soil Management  
EB41 Business Law  
MP14 Computational Methods  
*Humanities Elective*

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

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

<sup>1</sup>*May substitute AE12, AE32, or AE36 if timetable permits.*

**Year 2**

**Animal Science with minor in Agricultural Business**

**Agricultural Engineering**

*Semester III*

AS47	Animal Health
AS53	Poultry Production <sup>2</sup>
AS65	Project-Seminar
EB10	Accounting
EB340	Farm Management I
PS36	Field Crops

*Semester III*

AE30	Farm Machinery <sup>1</sup>
AS47	Animal Health
AS53	Poultry Production <sup>2</sup>
AS65	Project-Seminar
MP15	Introductory Physics
PS36	Field Crops

*Semester IV*

AS50	Dairy Production <sup>2</sup>
AS51	Beef & Sheep Production <sup>2</sup>
AS52	Swine Production <sup>2</sup>
AS55	Fur Production <sup>2</sup>
EB11	Applied Accounting and Taxation
PS37	Field Crop Management

*Semester IV*

AE34	Farm Tractors <sup>1</sup>
AS50	Dairy Production <sup>2</sup>
AS51	Beef and Sheep Production <sup>2</sup>
AS52	Swine Production <sup>2</sup>
AS55	Fur Production <sup>2</sup>
PS37	Field Crop Management

<sup>1</sup>May substitute AE12, AE32, or AE36 if timetable permits.

<sup>2</sup>May substitute AS37 or AS240 if timetable permits.

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

**Plant Science**

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

**Academic Entrance Requirements**

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

## Syllabus

### Year 1 Plant Science with specialization in

Agronomy		Horticulture		Ornamental Horticulture	
<i>Semester I</i>		<i>Semester I</i>		<i>Semester I</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	Technical Writing	H10	Technical Writing	H10	Technical Writing
PS30	Introduction to Plant Science	PS30	Introduction to Plant Science	PS30	Introduction to Plant Science
PS55	Plant Propagation	PS55	Plant Propagation	PS55	Plant Propagation
<i>Semester II</i>		<i>Semester II</i>		<i>Semester II</i>	
AS30	Animal Science	AE38	Horticultural Engineering	AE38	Horticultural Engineering
B41	Plant Physiology	B41	Plant Physiology	B41	Plant Physiology
B46	Weed Science	B46	Weed Science	B46	Weed Science
CS13	Soil Management	CS13	Soil Management	CS13	Soil Management
MP14	Computational Methods	MP14	Computational Methods	MP14	Computational Methods
PS49	Potato Production	PS49	Potato Production	PS38	Nursery Crop Production

### Year 2

<i>Semester III</i>		<i>Semester III</i>		<i>Semester III</i>	
AE30	Farm Machinery	MP15	Introductory Physics	PS39	Greenhouse Crop Management
AS34	Animal Nutrition <sup>1</sup>	PS39	Greenhouse Crop Management	PS43	Small Fruit Crops
EB340	Farm Management I	PS36	Field Crops	PS47	Turfgrass Production and Management <sup>1</sup>
MP15	Introductory Physics	PS43	Small Fruit Crops	PS50	Landscape Horticulture I
PS36	Field Crops	PS47	Turfgrass Production and Management <sup>1</sup>	PS53	Vegetable Production <sup>1</sup>
	<i>Humanities Elective</i>	PS53	Vegetable Production <sup>1</sup>	PS60	Landscape Plant Materials I

<sup>1</sup>May substitute PS65 or PS147 if timetable permits.



**Year 2 Plant Science with specialization in  
Agronomy**

**Horticulture**

**Ornamental Horticulture**

*Semester IV*

AE34 Farm Tractors

AS35 Feeds and Feeding<sup>1</sup>

B40 Plant Pathology

EB41 Business Law

PS37 Field Crop

Management

PS65 Plant Science

Project<sup>2</sup>

*Semester IV*

B40 Plant Pathology

PS38 Nursery Crop

Production

PS37 Field Crop

Management

PS44 Tree Fruit Crops

PS76 Plant Products

Physiology

*Humanities Elective*

*Semester IV*

B40 Plant Pathology

H140 Personnel Management

PS44 Tree Fruit Crops

PS61 Landscape Plant

Materials II

PS72 Landscape Maintenance

PS76 Plant Products

Physiology

<sup>1</sup>May substitute PS65 or PS147 if timetable permits.

<sup>2</sup>May substitute PS38 or PS44 if timetable permits.

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

## **Diploma of Technology Programs**

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

A candidate for these programs may qualify for admission with high school completion or equivalent. See syllabus of each program for specific admission requirements. Accepted students are asked to complete and submit medical information on the form provided.

Each candidate must be available for an interview if requested.

Students who successfully complete all the requirements will be granted a Diploma of Technology (Dipl. T.). A high honours diploma will be awarded to a student who has attained an average of at least 80%, and an honours diploma will be awarded to one who has attained an average of at least 75%.

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

### **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 June supplemental examination period immediately following the failure. A student in the final year may write one supplemental examination in a Fall semester course, 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 examinations.

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 examination. 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 an applicant does not 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.

## **Animal Health Technology**

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

### **Academic Entrance Requirements**

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

Applications will be accepted between January 1 and February 28.

## **Syllabus**

### **Year 1**

---

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

AS10	Orientation to Animal Health
AS34	Animal Nutrition
B15	Animal Anatomy
B20	Animal Physiology
CS14	Agricultural Chemistry
H10	Technical Writing

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

AS11	Animal Handling
AS15	Animal Genetics & Breeding
AS30	Animal Science
AS48	Animal Behaviour
B225	Microbiology
MP14	Computational Methods

### **Year 2**

---

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

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

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

AS36	Principles of Pharmacology
AS46	Animal Nursing & Clin. Proc. II
AS49	Veterinary Lab. Techniques II
AS40	Support Services in Vet. Prac.
H45	Technical Communication

#### ***Spring (May–June)***

AS80	Externship (AVC)
------	------------------



## Animal Health Technology (Cont'd)

### Year 3

---

#### *Semester V (Summer–Fall)*

AS81	Externship-Vet. Practice
AS82	Externship-Institutional

#### *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

## Biology Technology

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

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

## Academic Entrance Requirements

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

## Syllabus

### 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

---

**Biology Technology (Cont'd)**  
**Year 2**

*Semester III*

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

*Semester IV*

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

**Year 3**

*Semester V*

AS34	Animal Nutrition
B43	Entomology
B45	Biology Practicum I
B330	Ecology
	<i>Elective</i>

*Semester VI*

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

**Chemistry Laboratory Technology**

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

**Academic Entrance Requirements**

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

**Syllabus**  
**Year 1**

*Semester I*

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

*Semester II*

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

## **Chemistry Laboratory Technology (Cont'd)**

### **Year 2**

---

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

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

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

CS73	Laboratory Organization & Management
CS80	Project Implementation
CS310	Radiotracers in Agriculture
CS350	Food Chemistry
CS370	Instrumental Food Analysis
	<i>Elective</i>

## **Food Quality Technology**

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

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

## **Academic Entrance Requirements**

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

## **Syllabus**

### **Year 1**

---

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

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

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

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



## Food Quality Technology (Cont'd) Year 2

### *Semester III*

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

### *Semester IV*

AE135	Fundamentals of Food Processing
B55	Food Microbiology
CS225	Quantitative Analytical Chemistry
CS350	Food Chemistry
CS370	Instrumental Food Analysis
	<i>Elective</i>

## Year 3

### *Semester V*

CS85	Food Laboratory Practicum
------	---------------------------

### *Semester VI*

AS350	Meat Science
B41	Plant Physiology
CS55	Quality Control & Consumer Acceptance
CS73	Laboratory Organization & Management
PS76	Plant Products Physiology

## Landscape Horticulture Technology

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

### Academic Entrance Requirements

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

Additionally, the applicant must have passed one senior high school Chemistry course.

## Syllabus Year 1

### *Semester I*

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

### *Semester II*

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

## **Landscape Horticulture Technology (Cont'd)**

---

### *Spring Session*

PS70 Landscape Techniques—6 weeks

### **Year 2**

---

#### *Semester III*

AE14 Surveying  
B43 Entomology  
EB10 Accounting  
MP222 Computer Methods  
PS39 Greenhouse Crop  
Management  
PS71 Arboriculture  
PS73 Landscape Horticulture II

#### *Semester IV*

B46 Weed Science  
H60 Communication Techniques  
H140 Personnel Management  
PS38 Nursery Crop Production  
PS72 Landscape Maintenance  
PS74 Landscape Design and  
Construction

## **Technology Programs Entered from Technician Programs**

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

Students who successfully complete all the requirements 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.

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

### **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 June supplemental examination period immediately following the failure. A student in the final year may write one supplemental examination in a Fall semester course, 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 examinations.



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 examination. 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 an applicant does not 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.

### **Agricultural Technology**

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

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

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

### **Farming Technology**

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

Students wishing to pursue studies leading to a Diploma of Technology in Farming register for the first year of the Agricultural Business, Animal Science, Plant Science, or Agricultural Engineering Technician program. After successful completion of the first year, their applications are considered for



the Farming Technology program. Students with equivalent prerequisites from other college programs can also be considered. If accepted, the student's program of studies includes a minimum of three semesters of prescribed courses, four months of approved farm experience, and seven months of on-farm training under the direction of a farming instructor.

### **Entrance Requirements**

Satisfactory completion of the first year of the Agricultural Business, Agricultural Engineering, Animal Science, or Plant Science Technician program and a satisfactory selection interview.

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 fulfil the experience requirement.

### **Syllabus**

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

### **Year 1**

---

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

AS29 Farm Practices  
CS12 Principles of Soil Science  
CS14 Agricultural Chemistry  
EB10 Accounting  
EB40 Marketing Practices  
EB340 Farm Management I  
H10 Technical Writing  
MP15 Introductory Physics  
PS36 Field Crops

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

AE34 Farm Tractors  
CS13 Soil Management  
EB11 App. Acct. & Taxation  
EB220 Production Economics  
MP14 Computational Methods  
PS37 Field Crop Management

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

EB70 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.

**Farming Technology (Cont'd)**  
**Year 2**

---

***Semester IV***

EB42 Applied Farm Management

EB72 Farm Project

*13 electives*

***Recommended Electives:***

***Semester I***

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

***Semester II or IV***

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

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 an honours or high honours diploma to be awarded, the student's mark in the Farm Project must be at or above the minimum average mark requirement for honours or high honours.

## **Technical and Undergraduate 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: **Mr. Canning**

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

Fall semester — 1 lec and 4 labs per week.

#### **AE13: Shopwork**

Instructors: **Messrs. Hampton, Bholá and Roode**

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

Fall semester — 2 lecs and 4 labs per week.

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

#### **AE14: Surveying**

Instructor: **Mr. Hampton**

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

Fall semester — 2 lecs and 4 labs per week.



**AE15: Oil Hydraulics**

Instructor: **Prof. Rifai**

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

Winter semester — 3 lecs and 2 labs per week.

**AE19: Technical Drawing**

Instructor: **Mr. Canning**

*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: **Messrs. Bhola, Hampton and Roode**

*Prerequisite:* AE13

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

Winter semester — 2 lecs and 4 labs per week.

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

**AE23: Farm Equipment Dealership**

Instructor: **Prof. Cunningham**

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

Spring term — 6 weeks.

**AE27: Welding**

Instructors: **Mr. Roode**

*Prerequisite:* AE13

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

Winter semester — 2 lecs and 4 labs per week.

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

**AE30: Farm Machinery**

Instructor: **Prof. Adsett**

*Prerequisite:* MP14 or MP15

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

Fall semester — 2 lecs and 4 labs per week.

**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.



**AE36: Controls and Processing**

Instructor: **Prof. Adsett**

*Prerequisite:* MP15

*Preparatory:* AE12

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

Winter semester — 2 lecs and 4 labs per week.

**AE38: Horticultural Engineering**

Instructor: **Prof. Sibley**

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

Winter semester — 2 lecs and 4 labs per week.

**AE39: Tractor Overhaul**

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

*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.

Winter semester — 1 lec and 6 labs per week.

**AE40: Field Equipment Overhaul**

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

*Prerequisite:* AE30

*Preparatory:* AE20

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

Winter semester — 1 lec and 6 labs per week.



**AE45: Soil and Water Management**

Instructor: **Prof. Madani**

*Prerequisite:* AE14

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

Fall semester — 2 lecs and 4 labs per week.

**AE48: Shop Management**

Instructor: **Prof. Cunningham**

*Prerequisite:* AE23

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

Fall semester — 3 lecs and 2 labs per week.

**AE49: Electrical Systems**

Instructor: **Prof. Sibley**

*Prerequisite:* MP15

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

Fall semester — 2 lecs and 4 labs per week.

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

**AE63: Tractor Power**

Instructor: **Prof. Rifai**

*Prerequisite:* MP15

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

Fall semester — 2 lecs and 4 labs per week.

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

**AE65: Project-Seminar**

Coordinator: **Prof. Allen**

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

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

**AE68: Farmstead Equipment Overhaul**

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

*Prerequisite:* MP15

*Preparatory:* AE20

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

Winter semester — 1 lec and 6 labs per week.

**AE90: Technology Project**

Coordinator: **Prof. Sibley**

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.

**AE101: Computer Aided Graphics and Projection (EN)**

Instructor: **Prof. Cunningham**

Freehand sketching, instrument, and electronic 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, while developing skills of drafting using computer drafting facilities.

Fall semester — 2 lecs and 4 labs per week.

Text — Earle, *Engineering Design Graphics*.

**AE110: Statics (EN)**

Instructor: **Prof. Blanchard**

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

Winter semester — 3 lecs and 4 labs per week.

Text — Hibbeler, *Engineering Mechanics*.

**AE120: Properties and Mechanics of Materials (EN)**

Instructor: **Prof. Allen**

This course covers the properties of construction materials and machine parts and how these properties affect the performance of the materials in service. This course will also include information on force equilibrium, material stress, and modes of failure. The labs will offer both analytical and shopwork experiences. Load/deformation data for materials will be demonstrated as well as destructive testing. Cutting, fitting, and welding of metals will be practiced.

Fall semester — 3 lecs and 3 labs per week

**AE135: Fundamentals of Food Processing**

Instructor: **Prof. Blanchard**

The theory and application of food processing equipment is discussed. Theory includes fluid mechanics, heat transfer thermodynamics, and measurement applied to food material. Equipment such as pumps, fans, size reducers, conveyors, 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.



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

Instructor: **Prof. Cunningham**

*Prerequisite:* AE100

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

Winter semester — 1 lec and 4 labs per week.

Text — Earle, *Engineering Design Graphics*.

**AE215 Aquatic Environment**

Instructor: **TBA**

*Prerequisite:* AS210

Engineering principles are studied in context of requirements for environmental management of intensive aquaculture of finfish, molluscs, crustaceans, and marine plants of commercial importance. Topics in water habitat management will be emphasized including: water properties in both fresh and salt water systems, water quality and water purification, fluid dynamics and statics, and control of the aquatic environment.

Winter semester — 3 lecs and 3 labs per week.

First offered in year of Aquaculture program introduction.

**AE220: Dynamics I (EN)**

Instructor: **Prof. Rifai**

*Prerequisite:* 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*.

**AE260: Surveying (EN)**

Instructor: **Prof. Havard**

*Prerequisite:* MP100

*Preparatory:* MP105

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

Time — 2 weeks following winter semester.

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

Instructor: **Prof. Havard**

*Prerequisite:* MP110 or MP130

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

Winter semester — 3 lecs and 3 labs per week.

**AE310: Thermodynamics (EN)**

Instructor: **Prof. Allen**

*Prerequisite:* MP135

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

Fall semester — 3 lecs and 3 labs per week.

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

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

Instructor: **Prof. Allen**

*Prerequisite:* 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 force-induced effects. Topics include definition of stress-strain, stress-strain diagrams for ductile and brittle materials, axially loaded members, torsion, shear force and bending moment, stability and buckling, and biaxial stress and strain.

Winter semester — 3 lecs and 2 labs per week.

Text — Hibbeler, *Mechanics of Materials*.

**AE320: Structures and Their Environment (AE)**

Instructor: **Prof. Allen**

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

Fall semester — 3 lecs and 3 labs per week.

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

**AE335: Materials Handling and Processing (EN)**

Instructor: **Prof. Adsett**

*Prerequisite:* MP105

*Preparatory:* MP130

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

Fall semester — 3 lecs and 3 labs per week.

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

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

Instructor: **Prof. Madani**

*Prerequisite:* MP105

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

Fall semester — 3 lecs and 4 labs per week.

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



**AE350: Fluid Mechanics (EN)**

Instructor: **Prof. Madani**

*Prerequisite:* AE220

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

Winter semester — 3 lecs and 2 labs per week.

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

**AE355: Principles of Agricultural Machinery (EN)**

Instructor: **Prof. Sibley**

The objectives of this course are: to discuss the methods and equipment used to accomplish the various operations employed in agricultural production; to present agricultural machines as a system of sub-components performing different functions; and to present the engineering principles governing the operation of machines used in agricultural production. Emphasis is placed on crop production machinery-tillage, planting, chemical and fertilizer applications, and different harvesting systems.

Fall semester — 3 lecs and 3 labs per week.

Text — Svivastava, Goering and Rohrback, *Engineering Principles of Agricultural Machines*.

**AE360 Aquatic Engineering**

Instructor: **TBA**

Support facilities, equipment and systems for aquaculture operations will be examined. Topics studied will include: selection of component materials and structures suitable for confinement, protection, and support of aquaculture species; selection and application of mechanical/electrical support equipment such as pumps, motors, feeders, aerators, water heating systems, waste management systems and monitoring equipment; and engineering aspects of facilities for harvesting, handling, processing, packaging, and preservation of aquatic production.

Fall semester — 3 lecs and 3 labs per week.

First offered in year following Aquaculture program introduction.

**AE405: Environmental Impacts & Resource Management (AE)**

Instructor: **Prof. Blanchard**

*Prerequisite:* B100 & CS110

This course addresses the issues associated with the safe and ecologically appropriate handling, processing, storage, and utilization of the by products of agricultural and bioresource production systems. Physical, chemical, and biological treatment process for solid and liquid wastes will be reviewed. Reduction of air and water impacts will be considered. Structural, energy, and climatic limitations on waste management techniques will be included. Labs will include visits to treatment and storage sites.

Fall semester — 3 lecs and 3 labs per week

**AE410: Water & Water Quality Management (EN)**

Instructor: **Prof. Madani**

Principles of soil and water management including control of the plant-soil-water environment, monitoring and evaluation of principles and structures applied to irrigation and drainage, and methods of controlling non-point source pollution in agriculture are discussed. Water table management models and their evaluations for Atlantic Canada conditions are also discussed.

Winter semester — 3 lecs and 3 labs per week

**AE415: Directed Studies in Agricultural Engineering (EN)**

Instructor: **TBA**

Independent studies are developed through literature review, laboratory or field research on topics pertinent to agricultural engineering.

**AE420: Management of Mechanized Agricultural Systems (AE)**

Instructor: **Prof. Adsett**

*Prerequisite:* MP105 or MP130

*Preparatory:* EB340

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

Winter semester — 2 lecs and 4 labs per week. Offered in alternate years; offered in 1995–96.

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

Coordinator: **Prof. Blanchard**

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

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

Winter semester — 1 scheduled seminar session per week.

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

Coordinator: **Prof. Blanchard**

*Prerequisite:* AE449

Restricted to Agricultural Mechanization students in their final year.

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

Fall semester — 4 labs per week.

## **Animal Science**

**AS10: Orientation to Animal Health**

Instructor: **Prof. Ramsay**

This course is designed to introduce the AHT student to the field of Animal Health and to begin training in the animal care duties associated with cats and dogs. The history and use of AHTs and their equivalents is followed by an examination of the principles of sanitation and disease control in the animal facility. Application of these principles is practiced in assigned periods of duty in the College's facilities. The 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 and 1 lab per week .



**AS11: Animal Handling**

Instructor: **Prof. Ramsay**

*Prerequisite:* AS10, B15

*Corequisites:* AS30, AS48

Students are presented with various species or classes of domestic animal. A single classroom period is followed by a three-hour animal-contact laboratory period. Equipment associated with animal handling procedures is also dealt with. Animal Handling enables the student to restrain and manage various types of animal in clinical and other situations and to recognize warning signs which signal potential danger to themselves and other personnel.

Winter semester — 1 lec and 3 labs 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: **TBA**

*Prerequisites:* AS10, B15, B20, B225

*Corequisite:* AS47

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

Fall semester — 3 lecs per week.

**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, anaesthesiology, surgical preparation, sample collection, and radiography in addition to the application of simple bandages and splints. The major animal types used are the dog and cat, but certain clinical periods will deal with procedures performed on livestock. Student performance should demonstrate observance of principles and good manual skills.

Fall semester — 4 lecs and 5 labs per week.

**AS29: Farm Practices**

Coordinator: **TBA**

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

**AS30: Animal Science**

Instructor: **TBA**

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

Winter semester — 3 lecs and 2 labs per week.

**AS33: Applied Animal Physiology**

Instructor: **Prof. Lirette**

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

Winter semester — 2 lecs and 2 labs per week.

**AS34: Animal Nutrition**

Instructor: **TBA**

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

Fall semester — 3 lecs per week.

**AS35: Feeds and Feeding**

Instructor: **TBA**

*Prerequisite:* AS34

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

Winter semester — 3 lecs and 2 labs per week.

**AS36: Principles of Pharmacology**

Instructor: **Dr. Prowse**

*Prerequisites:* AS25, B20

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

Winter semester — 3 lecs per week.

**AS37: Laboratory Animal Care I**

Instructor: **Prof. Ramsay**

*Prerequisites:* B20

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 or CS14

*Corequisites:* AS24

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

Fall semester — 4 lecs and 6 labs per week.

**AS40: Support Services in Veterinary Practice**

Instructor: **Prof. Ramsay**

*Prerequisites:* AS10, MP14

This course examines various aspects of veterinary practice especially as they affect the animal health technologist. The business, organizational, legislative, ethical, and economic aspects of veterinary practice are detailed. Support Services in Veterinary Practice enables the animal health technologist to perform vital non-clinical and non-laboratory functions. The animal health technologist gains an understanding of the economic, ethical, and legal basis for veterinary practice in Canada.

Winter semester — 4 lecs per week.

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

Instructor: **TBA**

*Prerequisites:* AS24, AS25, AS37

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

Winter semester — 4 lecs and 5 labs per week.

**AS47: Animal Health**

Instructor: **TBA**

*Prerequisite:* B20

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

Fall semester — 2 lecs and 2 labs per week.

**AS48: Animal Behaviour**

Instructor: **Prof. Tennessen**

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

Winter semester — 2 lecs and 1 lab per week.

**AS49: Veterinary Laboratory Techniques II**

Coordinator: **Prof. Ramsay**

*Prerequisite:* AS39, AS24

*Corequisite:* AS46

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

Winter semester — 4 lecs and 5 labs per week.

**AS50: Dairy Production**

Instructor: **Prof. Fredeen**

*Prerequisites:* AS20, B20, AS34

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

Winter semester — 3 lecs and 2 labs per week.

**AS51: Beef and Sheep Production**

Instructors: **Profs. Farid and Lirette**

*Prerequisites:* AS20, B20, AS34

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

Winter semester — 3 lecs and 2 labs per week.

**AS52: Swine Production**

Instructor: **Prof. Anderson**

*Prerequisites:* AS20, B20, AS34

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

Winter semester — 2 lecs and 4 labs per week.

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

**AS53: Poultry Production**

Instructor: **Prof. Crober**

*Prerequisites:* AS20, B20, AS34

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

Fall semester — 2 lecs and 4 labs per week.

**AS55: Fur Production**

Coordinator: **TBA**

*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, AS81

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

Winter semester — 3 lecs 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: **TBA**

*Prerequisites:* AS37, AS15, and AS46

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

Winter semester — 2 lecs and 4 labs per week.

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

Instructor: **TBA**

*Prerequisites:* AS80, AS81, and AS82

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 — 4 lecs and 4 labs per week.

**AS80: Externship — AVC**

Coordinator: **Prof. Ramsay**

*Prerequisites:* AS36, AS46, AS49 or

Recommendation of the Department of Animal Science.

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

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

Students work with and learn from AHTs and other para-professional staff at AVC.

Accommodation and special clothing is provided by the College, but other expenses are the responsibility of the student. A percent mark is assigned.

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

**AS81: Externship-Veterinary Practice**

Coordinator: **Prof. Ramsay**

*Prerequisites:* AS36, AS46, AS49 and AS80

Externship experiences are arranged through the College at approved private veterinary practices. Students and externship locations are matched through a process similar to employment applications. During the course the student gains experience on a variety of clinical and relevant administrative procedures related to the provision of Animal Health services. The student-trainee normally works for a salary. A credit for satisfactory performance is assigned.

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

**AS82: Externship-Institutional**

Coordinator: **Prof. Ramsay**

*Prerequisites:* AS36, AS46, AS49 and AS80

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



**AS82: Externship-Institutional (Cont'd)**

Typical locations for this externship include: universities and colleges, research establishments, veterinary pathology laboratories, pharmaceutical companies, humane societies, and pounds. The AHT student is expected to perform technical tasks on the job and function in general as an employed AHT.

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

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

**AS90: Technology Project**

Coordinator: **Prof. Anderson**

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

Time to be announced.

**AS95: Animal Health Technology Project**

Coordinator: **Prof. Ramsay**

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

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

Winter semester — 1 lec and 4 labs per week.



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

Instructor: **Prof. Lirette**

*Prerequisites:* IN100, IN101

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

Fall semester — 3 lecs and 3 labs per week.

**AS210 Introduction to Aquaculture**

Instructor: **TBA**

*Prerequisites:* IN100, IN101

The history and current status of world aquaculture production is discussed, with emphasis on species with potential in Atlantic Canada. Advances in fresh water or marine fish culture are considered. The course includes field trips to fish hatcheries, commercial mollusc production units, fish processing facilities, and other industrial facilities. A review of aquatic resource regulations is included.

Fall semester — 3 lecs and 3 labs per week.

First offered in year of Aquaculture program introduction.

**AS240 The Horse: Its Biology and Use (A)**

Instructor: **Prof. Tennessen**

*Prerequisite:* Second-year standing or equivalent

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

Fall semester — 2 lecs and 2 labs per week.

**AS300: Animal Physiology (A)**

Instructor: **TBA**

*Prerequisites:* B110, IN100, IN101

*Preparatory:* CS205

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

Fall semester — 3 lecs and 3 labs per week.

**AS305: Animal Nutrition (A)**

Instructor: **Profs. Fredeen and Anderson**

*Prerequisite:* CS200

*Preparatory:* CS205

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

Fall semester — 3 lecs and 2 labs per week.

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

**AS310: Animal Breeding (A)**

Instructor: **Prof. Patterson**

*Prerequisites:* B240, 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: **TBA**

*Prerequisite:* AS300

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

Winter semester — 3 lecs and 2 labs per week.

**AS320: Animal Health (A)**

Instructor: **Dr. Semple**

*Prerequisites:* B225, IN100, IN101

*Preparatory:* CS205

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

Winter semester — 2 lecs and 2 labs per week.

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

Instructor: **Profs. Fredeen and Anderson**

*Prerequisite:* AS305

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

Winter semester — 3 lecs and 2 labs per week.

Text — Church, *Livestock Feeds and Feeding*.

**AS335: Environmental Physiology (A)**

Instructor: **Prof. Tennessen**

*Prerequisite:* AS300

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

Winter semester — 2 lecs and 2 labs per week.

**AS341: Domestic Animal Behaviour (A)**

Instructor: **Prof. Tennessen**

*Corequisite:* AS300

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

Fall semester — 3 lecs and 2 labs per week.



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

Instructor: **Prof. Firth**

*Prerequisites:* B225, CS200, IN100, IN101 or consent of the Instructor

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

Fall semester — 2 lecs and 2 labs per week.

**AS350: Meat Science (A)**

Instructor: **Prof. Firth**

*Prerequisites:* CS200, B225, IN100, IN101 or consent of the Instructor

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

Winter semester — 2 lecs and 2 labs per week.

**AS365 Fish Nutrition**

Instructor: **TBA**

*Prerequisite:* AS305

Nutrients required by finfish, shellfish, crustaceans, and molluscs are discussed in context with current and future sources of these nutrients. Digestive physiology and specific feeding problems of aquatic species are addressed. Diet formulations and feeding strategies for maintenance, growth, and reproductive performance of fish are covered.

Winter semester — 3 lecs and 2 labs per week.

First offered in year following Aquaculture program introduction.

**AS370 Fish Health**

Instructor: **TBA**

*Prerequisite:* AS380

This course outlines concepts of disease with special reference to fish. Diseases of various etiological types are considered, with emphasis on those in the aquaculture environment. The relationships of management and economics to disease in cultured fish are detailed and public health concerns are addressed. Diagnostic, prophylactic, and treatment methods are outlined and practised.

Winter semester — 3 lecs and 3 labs per week.

First offered in year following Aquaculture program introduction.

**AS375 Aquatic Ecology**

Instructor: **TBA**

*Prerequisite:* AS215

The biology of aquatic species in marine and fresh water environments is discussed. Biological systems involving farmed species are emphasized. Organism interdependencies and interactions are examined. An introduction to the principles of ecology at the community and ecosystem level of integration is included.

Winter semester — 3 lecs and 3 labs per week.

First offered in year following Aquaculture program introduction.

**AS380 Physiology of Aquatic Animals**

Instructor: **TBA**

*Prerequisites:* B110

The form, function, physiological integration, and behaviour of major types of aquatic animals is considered. Emphasis is placed on Classes of organisms, using commercially important species as primary examples.

Fall semester — 3 lecs and 3 labs per week.

First offered in year following Aquaculture program introduction.

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

*Prerequisites:* AS300, AS305, AS310

**AS400: Dairy Production (A)**

Instructor: **Prof. Fredeen**

Fall semester — 3 lecs and 2 labs per week.

Text — Schmidt and Van Vleck, *Principles of Dairy Science*.

**AS405: Swine Production (A)**

Instructor: **Prof. Anderson**

Fall semester — 3 lecs and 3 labs per week.

Text — English, Fowler, Baxter and Smith, *Growing Finishing Pig Improving Efficiency*

**AS415: Beef Production (A)**

Instructor: **Prof. Lirette**

Winter semester — 3 lecs and 3 labs per week.

**AS420: Sheep Production (A)**

Instructor: **Prof. Farid**

Fall semester — 3 lecs and 2 labs per week.

**AS425: Poultry Production (A)**

Instructor: **Prof. Crober**

Winter semester — 3 lecs and 3 labs per week.

Text — North, *Commercial Chicken Production Manual*.

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

Instructor: **Prof. K. Rouvinen**

Winter semester — 2 lecs and 2 labs per week.

**AS440: Finfish Production**

Instructor: **TBA**

*Prerequisites:* AS365, AS370, AS380.

Aspects of breeding and genetics, fish management, financial management, economics, marketing, housing systems, and water management are presented in an integrated approach to provide a sound understanding of this aspect of aquaculture. Management of finfish throughout the life cycle is presented. Fish farm structure, fish processing, and environmental impact are also discussed.

Fall semester — 3 lecs and 3 labs per week.

First offered two years after Aquaculture program introduction.

**AS445 Shellfish Production**

Instructor: **TBA**

*Prerequisites:* AS365, AS370, AS380

Factors affecting profitable production of shellfish are discussed in the context of developing a sound industry with potential to address future opportunities. A survey of culture techniques used in shellfish production is undertaken.

Winter semester — 3 lecs and 3 labs per week.

First offered two years after Aquaculture program introduction.



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

Instructors: **Animal Science Faculty**

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

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

Fall semester — 2 labs per week.

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

Instructors: **Animal Science Faculty**

*Prerequisite:* AS449

Winter semester — 2 labs per week.

**AS460: Avian Biology (A)**

Instructor: **Prof. Crober**

*Prerequisites:* CS200, B200, B240, IN100, IN101

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

Fall semester — 3 lecs and 2 labs per week.

**AS475: Ruminant Digestive Physiology & Metabolism**

Instructors: **Profs. Fredeen and Lirette**

*Prerequisites:* AS300, AS305, CS360

This course is designed to provide an intensive study of food intake and digestion, and nutrient absorption and metabolism, in the ruminant animal. The course details current knowledge and focuses on aspects of future research interest. Students are expected to contribute to discussions and present reviews to the class on various aspects of the subject.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; not offered in 1995–96.

## **Biology**

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

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

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

Winter semester — 3 lecs and 4 labs per week.

### **B15: Animal Anatomy**

Instructor: **Prof. Crosby**

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

Fall semester — 2 lecs and 4 labs per week.

### **B20: Animal Physiology**

Instructor: **Prof. Eaton**

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

Fall semester — 3 lecs and 2 labs per week.

### **B25: Histological Techniques**

Instructor: **Prof. Crosby**

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

Winter semester — 2 lecs and 5 labs per week.

**B40: Plant Pathology**

Instructor: **Prof. Gray**

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

Winter semester — 2 lecs and 3 labs per week.

**B41: Plant Physiology**

Instructor: **Prof. Eaton**

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

Winter semester — 3 lecs and 3 labs per week.

**B43: Entomology**

Instructor: **Prof. Le Blanc**

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

Fall semester — 2 lecs and 2 labs per week.

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

**B45: Biology Practicum I**

Instructor: **Biology Faculty**

This course is available only to Biology Technology students. This course is designed to provide an opportunity for Biology Technology students to develop a basic understanding of, and practical experience in, selected techniques in laboratory and field biology. Techniques will include soil sampling, quadrat sampling for plants, capture-recapture techniques for animals, and disease rating for crops.

Fall semester — 6 labs per week.



**B46: Weed Science**

Instructor: **Prof. Sampson**

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

Winter semester — 3 lecs and 3 labs per week.

**B48: Plant Tissue Culture**

Instructor: **Prof. Olson**

*This course has limited enrolment.*

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: **TBA**

*Prerequisite: B225*

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

Winter semester — 3 lecs and 4 labs per week.

**B60: Biology Practicum II**

Instructor: **Biology Faculty**

This course is available only to Biology Technology students. Biology Practicum II is a continuation of Biology Practicum I. It is designed to provide an opportunity for Biology Technology students to develop a basic understanding of, and practical experience in, selected techniques in laboratory and field biology. Techniques will include media preparation, maintaining biological cultures, museum techniques, and preparation of bioplastic mounts.

Winter semester — 6 labs per week.

**B75: Biological Photography**

Instructor: **Prof. Le Blanc**

*This subject has limited enrolment.*

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

Winter semester — 2 lecs and 4 labs per week.

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

**B100: Botany (S)**

Instructor: **Prof. Olson**

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

Fall semester — 3 lecs and 4 labs per week.

**B110: Zoology (S)**

Instructor: **Prof. Crosby**

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

Winter semester — 3 lecs and 4 labs per week.

**B200: Cell Biology (S)**

Instructor: **Prof. Crosby**

An introduction to cell biology. Topics include cell metabolism, the structure and function of organelles of the eucaryotic cell, cell growth, cell movement, and the procaryotic cell. Specialized cell functions will also be discussed.

Fall semester — 3 lecs per week.

**B225: Microbiology (S)**

Instructor: **Prof. Stratton**

*Preparatories:* B100, B110

A general introduction to microbiology. Topics include history, morphology, structure, cultivation, reproduction, metabolism, genetics, classification, and control of microorganisms. The importance of microorganisms to soil productivity, foods, industry, veterinary science, public health, and sanitation is discussed. Students are required to have a laboratory coat.

Winter semester — 3 lecs and 3 labs per week.

**B240: Genetics I (S)**

Instructor: **Prof. Atlin**

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

Fall semester — 3 lecs and 2 labs per week.

**B245: Genetics II (A)**

Instructor: **Prof. Atlin**

*Prerequisite:* B240

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

Winter semester — 3 lecs and 2 labs per week.

**B260: Plant Physiology (S)**

Instructor: **Prof. Eaton**

A study of the different functions of the plant, including growth, photosynthesis, mineral nutrition, water relations and translocation of solutes, and plant orientation, development, and reproduction.

Winter semester — 3 lecs and 3 labs per week.



**B265: Systematic Botany (S)**

Instructor: **Prof. Olson**

*Preparatory:* B100 or equivalent

The general principles and concepts of vascular plant systematics with emphasis on the angiosperms are examined. Botanical nomenclature, methods used in plant identification, classification schemes, sources of taxonomic evidence, and the evolution of major taxa are among the topics presented in the lectures. The laboratory focuses on the recognition of certain local taxa and provides experience in the collection, identification, and preparation of herbarium specimens from the local flora. Students planning to enrol in this course are expected to make a collection of pressed plants during the preceding summer.

Fall semester — 3 lecs and 3 labs per week.

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

**B270: Structural Botany (S)**

Instructor: **Prof. Olson**

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

Winter semester — 3 lecs and 3 labs per week.

**B300: Principles of Plant Pathology (A)**

Instructor: **Prof. Gray**

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

Fall semester — 3 lecs and 3 labs per week.

**B310: Mycology (S)**

Instructor: **Prof. Gray**

*Prerequisite:* B100

An introductory course dealing with the morphology, taxonomy, ecology, and physiology of the members of the Fungus kingdom.

Fall semester — 3 lecs and 3 labs per week.

**B320: General Entomology (S)**

Instructor: **Prof. Le Blanc**

*Preparatory:* B110

An introduction to the science of entomology from an agricultural perspective. Insect anatomy, physiology, and taxonomy are considered; also included are discussions on insect behaviour, reproduction, life cycles, and population ecology. Basics of monitoring techniques and population dynamics are illustrated.

Fall semester — 3 lecs and 3 labs per week.

Text — Borror et al., *Introduction to the Study of Insects* (6th edition).

**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 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.

**B350: Ecological Methods (S)**

Instructor: **Prof. Vilis Nams**

*Prerequisite:* a statistics course

*Corequisites:* B330

Ecological methods are statistical sampling methods applied to ecology. The course is arranged around daily problem sets which use a combination of ecological computer programs and hand calculations and field labs to give hands-on experience in sampling. Topics include capture-recapture population estimates, spatial distributions, quadrat sampling. Topics include capture-recapture population estimates, spatial distributions, quadrat sampling, sampling design, and experimental design.

Fall semester — 3 lecs and 4 labs per week.

**B360: Environmental Analysis (S)**

Instructor: **Prof. Stratton**

*Prerequisites:* B200, B225, CS205

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

Fall semester — 3 lecs and 4 labs per week.

**B365: Environmental Impact (S)**

Instructor: **Prof. Stratton**

*Prerequisites:* B330, B360

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

Winter semester — 3 lecs and 4 labs per week.



**B385: Principles of Pest Management (A)**

Instructor: **Biology Department Faculty**

*Prerequisites:* B100, B110

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

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

**B400: Soil Microbiology (A)**

Instructor: **Prof. Stratton**

*Prerequisites:* B225, IN100, IN101

A study of the biology of the various classes of microorganisms in soil, including bacteria, blue-green algae, fungi, algae, protozoa, and viruses. This course includes details of biochemical transformation of carbon, nitrogen, sulfur, and phosphorous, as well as pesticides and wastes in the environment.

Fall semester — 3 lecs and 4 labs per week.

**B405: Pesticides in Agriculture (A)**

Coordinator: **Prof. Sampson**

*Preparatories:* B300, B320, B335

A course dealing with various aspects of pesticides used in agriculture. The course will look at pesticides from their origin and development to their registration, sale, distribution, and use. Also included are discussions of safety and toxicology.

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

**B406: Economic Plant Pathology (A)**

Instructor: **Prof. Gray**

*Prerequisite:* B300

An in-depth study of the important plant diseases representative of the major groups of pathogens with particular attention to diseases affecting field crops, fruit and vegetable crops, turfgrasses, and greenhouse crops. Labs deal with advanced techniques used in plant pathology, such as ELISA for virus identification, R-PAGE for viroid identification, TLC for mycotoxin identification, and preparation of materials for scanning electron microscopy.

Winter semester — 3 lecs and 3 labs per week.

**B425: 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.

**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.

**B445: 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.

**B449: Project-Seminar I**

Instructors: **Department of Biology Faculty**

Coordinators: **Profs. Eaton and Nams**

An introduction to independent research and effective communication for final year students of both majors of the Agribiology Option. Students will acquire skills in written and oral scientific communication, library use, and information retrieval. Each student will design and implement an individual research project, including data acquisition and analysis, and will begin the process of communicating result in both oral and written form. The research topic and advisor(s) are chosen by the student in cooperation with the course coordinator.

Fall semester — 2 lecs and 4 labs in three two-period blocks.

Text — Day, *How to Write and Publish a Scientific Paper-CBE Style Manual*.

**B450: Project-Seminar II**

Instructors: **Department of Biology Faculty**

Coordinators: **Profs. Eaton and Nams**

A continuation of B449. Students will prepare and perform an oral presentation on a biology topic of their choice early in the semester. They will conclude their projects and represent their findings near the semester in three formats: poster presentation, scientific seminar, and written paper.

Winter semester — 2 lecs and 4 labs in three two-period blocks.

## Chemistry and Soil Science

**CS01: Pre-Tech Chemistry**

Instructor: **Prof. Hawley**

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

Winter semester — 3 lecs and 3 labs per week.

Text — Seese and Daub, *Basic Chemistry* (6th edition).



**CS12: Principles of Soil Science**

Instructor: **Prof. Miller**

Designed to form a basis for the understanding of soil productivity. The course investigates the physical, chemical, and biological properties of soil. Laboratory exercises, using soils from the Atlantic region, are designed to illustrate the lecture material and introduce methods of soil analysis.

Fall semester — 3 lecs and 2 labs per week.

**CS13: Soil Management**

Instructor: **Prof. Miller**

*Prerequisite:* CS12

A study of the chemical, physical, and biological properties of soil as they relate to crop production. Soil fertility and fertilizer use, tillage and water management, and biological husbandry are discussed. Labs take the form of problem-solving tutorials in soil management.

Winter semester — 3 lecs and 2 labs per week.

**CS14: Agricultural Chemistry**

Instructor: **Prof. Hawley**

Stresses the application of basic chemistry to the agricultural industry. Topics include chemical arithmetic; protection chemicals; sewage disposal; explosives; energy; iron; useful materials from the earth, sea, and air; chemurgy; water; metallurgy; nuclear chemistry; and chemical hazards. Students are also introduced to organic chemistry and applied biochemistry and are taught to identify carbohydrates, proteins, fats, oils, and the vitamins, enzymes, hormones, and nucleic acids.

Fall semester — 3 lecs and 2 labs per week.

Text — Jones et al., *Chemistry and Society* (5th edition).

**CS30: Chemical Calculations**

Instructor: **Prof. Hawley**

A course designed to provide the skills needed to carry out chemical calculations associated with chemistry laboratory techniques. Specific topics include: moles, percentages, concentration of solutions, dilutions, stoichiometry, pH, weak acids and bases, buffers, and recovery experiments.

Fall semester — 3 lecs per week.

**CS40: Food Laboratory Methods**

Instructor: **Prof. Crowe**

A laboratory course 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 — 3 lecs and 4 labs per week.

Text — Pomeranz and Meloan, *Food Analysis: Theory and Practice* (2nd edition).

**CS42: Organic Chemistry**

Instructor: **Prof. Payne**

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

Fall semester — 3 lecs and 4 labs per week.

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

**CS43: Bio-Organic Chemistry**

Instructor: **Prof. Payne**

*Prerequisites:* CS42

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

Winter semester — 3 lecs and 4 labs per week.

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

**CS50: Introduction to Physical Chemistry**

Instructor: **Prof. Hoyle**

*Prerequisite:* 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.

**CS55: Quality Control and Consumer Acceptance**

Instructor: **Prof. Crowe**

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

Winter semester — 3 lecs and 3 labs per week.

**CS68: Introductory Laboratory Techniques**

Instructor: **Prof. Payne**

An introduction to general laboratory techniques, safety, and chemical calculations and to problems associated with solution and classical chemical analysis. Techniques include: massing, pipetting, titrimetry, extracting, digesting, colorimetry, and T.L.C.

Fall semester — 3 lecs and 4 labs per week.

Texts— Shuger et al., *Chemical Technicians Ready Reference Handbook* (3rd edition); American Chemical Society, *Safety in Academic Chemistry Laboratories* (5th edition).

**CS69: Introductory Instrumentation**

Instructor: **Prof. Brewster**

*Prerequisite:* CS68

An introduction to the practical basic skills of the more commonly used instrumental methods of analysis and the chemical calculations and problems involved in these analyses. The areas covered are: chromatography, radioisotopes, atomic absorption, and flame photometry.

Winter semester — 2 lecs and 4 labs per week.



**CS73: Laboratory Organization and Management**

Instructor: **TBA**

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

Winter semester — 2 lecs and 4 labs per week.

**CS75: Basic Food Chemistry**

Instructor: **A. Havard**

*Prerequisite:* CS42, CS43

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

Fall semester — 3 lecs and 4 labs per week.

Text — Meyer, *Food Chemistry*.

**CS79: Project Organization**

Coordinator: **Prof. Payne**

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

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

**CS80: Project Implementation**

Coordinator: **Prof. Payne**

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

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

**CS85: Food Laboratory Practicum**

Coordinator: **Prof. Crowe**

This Food Lab Practicum is designed to provide the students with hands-on experience and instruction in a typical workplace setting. In their third year of the Food Lab Technology program, students will spend September to December in this practicum. Wherever possible, students will be placed with cooperating food industries most closely in line with their interests. Prospective employers of the Food Lab Technology students could include dairies, wineries, breweries, product development and quality control laboratories, as well as firms involved in the processing of meat, fish, vegetables, fruits, and cereals. In addition to this practicum, students are encouraged to pursue summer employment within the food industry.

Fall semester

**CS100: Chemical Principles (S)**

Instructor: **TBA**

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

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

Fall semester — 3 lecs and 4 labs per week.

Text — McQuarrie and Rock, *General Chemistry* (3rd edition).

**CS110: Organic Chemistry (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS100

A study of basic classes of organic compounds, including alkanes, alkynes, petroleum and petrochemicals, aromatic compounds, alcohols, aldehydes, ketones, alkyl halides, monocarboxylic acids, acid anhydrides, salts, amides, ethers, and amines.

Winter semester — 2 lec, 1 tutorial, and 4 labs per week.

**CS200: Biochemistry I (S)**

Instructor: **Prof. Robinson**

*Prerequisite:* CS110

This course consists of a study of biological elements, buffers, amino acids and peptides, proteins, lipids, membrane structures, carbohydrates, nucleic acids, and enzymes.

Fall semester — 3 lecs and 4 labs per week.

Text — Voet and Voet, *Biochemistry*.

**CS205: Biochemistry II (S)**

Instructors: **TBA**

*Prerequisite:* CS200

Includes a study of enzyme kinetics, mechanisms of enzyme action, vitamins and coenzymes, digestion and absorption, bioenergetics, catabolism of carbohydrates, lipids and nitrogen compounds, selected biosyntheses, nitrogen fixation, and metabolism control mechanisms.

Winter semester — 3 lecs and 4 labs per week.

Text — Voet and Voet, *Biochemistry*.

**CS210: Advanced General Chemistry**

Instructor: **TBA**

*Prerequisite:* CS100

This course covers several concepts of chemistry at an advanced level: these include theories of the chemical bond, the solid and liquid state, energy changes, chemical kinetics, electrochemistry, complex compounds, periodic trends for the elements and representative compounds. The laboratory portion of the course will include qualitative analysis.

Fall Semester — 3 lecs and 4 labs per week. Offered in alternate years; not offered in 1995–96.

Text — McQuarrie and Rock, *General Chemistry* (3rd edition).

**CS215: Advanced Organic Chemistry (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS110

This course will cover advanced topics in organic chemistry. These will include an in-depth study of organic reaction mechanisms, reactions of heterocyclic compounds and the pathways of decomposition of organic compounds. Other advanced organic chemical topics such as nuclear magnetic resonance spectroscopy, mass spectrometry and the use of isotopes in organic chemistry will be covered depending upon the interests of students enrolled in the course.

Fall semester — 3 lecs and 4 labs per week.



**CS220: Introduction to Soil Science (A)**

Instructor: **Prof. Brewster**

*Prerequisite:* CS100

General principles of soil science relating to the origin, development, and classification of soils; the biological, physical, and chemical properties of soils and their relation to proper soil and crop management, land use, and soil conservation.

Fall semester — 3 lecs and 4 labs per week.

Text — Miller and Donahue, *Soils: An Introduction to Soils and Plant Growth* (6th edition).

**CS225: Quantitative Analytical Chemistry (S)**

Instructor: **TBA**

*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. Offered in alternate years; not offered in 1995–96.

Text — Harris, *Quantitative Chemical Analysis* (3rd edition).

**CS230: Introduction to Geology (A)**

Instructor: **Prof. Brewster**

Topics of this course are: materials of the earth, structure of the earth and plate tectonics, and landscape development. Geological factors important in soil formation will be stressed. Labs include mineral and rock identification, topographic map interpretation, and a field trip.

Winter semester — 3 lecs and 3 labs per week.

Text — Thompson and Turk, *Modern Physical Geology*.

**CS300: Physical Chemistry I (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS210

General principles of physical chemistry will be studied. These will include chemical kinetics and equilibrium, classical and statistical thermodynamics, diffraction methods, introductory quantum theory and photochemistry. In addition, there will be a strong emphasis on the use of computers to solve physical chemical problems.

Fall semester — 3 lecs and 4 labs per week. Offered in alternate years; not offered in 1995–96.

**CS305: Instrumental Analytical Chemistry (S)**

Instructor: **Prof. Crowe**

*Prerequisite:* Recommend CS225, and either CS110 or CS42.

Introduction to the basic theory underlying important techniques in instrumentation chemistry. Design of instruments, operation, and applications will be studied. Laboratory work will include experiments in soils, plant and biological tissue, food, drugs, and vitamins. Instruments in the field of absorption and emission spectrophotometry, chromatography, and electrochemistry will be studied.

Fall semester — 3 lecs and 4 labs per week.

**CS310: Radiotracers in Agriculture (A)**

Instructor: **Prof. Robinson**

*Prerequisites:* CS200 or CS43, and MP100

*This course has limited enrolment.*

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*.

**CS320: Soil Fertility (A)**

Instructor: **Prof. Warman**

*Prerequisites:* IN100, IN101

*Preparatory:* B260

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

Winter semester — 3 lecs and 4 labs per week.

Text — Tisdale, Nelson and Beaton *Soil Fertility and Fertilizers* (5th edition).

**CS325: Soil Genesis and Classification (A)**

Instructor: **Prof. Brewster**

*Prerequisites:* IN100, IN101

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. Offered in alternate years; offered in 1995-96.

**CS335: Soil Physics (A)**

Instructor: **Prof. Miller**

*Prerequisites:* IN100, IN101 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. Offered in alternate years; not offered in 1995-96.

**CS345: Soil Conservation in Agriculture (A)**

Instructor: **Prof. Miller**

*Prerequisites:* IN100, IN101

A study of the processes of soil degradation and its prevention or amelioration. A major part of the course concerns the erosion of agricultural soils and its control. Other topics include soil compaction and soil acidification, soil reclamation, use of soil in waste recycling, and the role of soil in water conservation. Lab periods may be used for field trips, tutorials, or seminars.

Fall semester — 3 lecs and 3 labs per week.



**CS350: Food Chemistry (A)**

Instructor: **A. Havard**

*Prerequisites:* CS225, CS305, and either CS200 or CS75

A study of the functions of the basic group compounds found in foods. The subject matter includes the functions of water, carbohydrates, lipids, proteins, enzymes, vitamins, minerals, and food additives in foods and their relationship to food characteristics and quality. An introduction to food preservation methods is also included. The laboratory section of the course will involve the use of instrumentation for the analytical determination of various food constituents. This course cannot be taken for credit by students who have a credit in CS351.

Winter semester — 3 lecs and 4 labs per week.

Text — Fennema, *Food Chemistry* (2nd edition).

**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**

*Prerequisite:* 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).

**CS370: Instrumental Food Analysis (S)**

Instructor: **Prof. Crowe**

*Prerequisites:* CS305 and CS110 or CS42

*Corequisite:* CS350

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

Winter semester — 3 lecs and 4 labs per week.

**CS415: Special Topics in Chemistry and Soil Science I (A)**

Instructors: **Chemistry and Soil Science Staff**

An optional course for Agricultural Chemistry and Soil Science students who want to study a special topic. Course material will be arranged with Chemistry and Soil Science faculty. The course will be conducted by special tutorials, assigned readings and independent lab work where appropriate. This course will normally be taken by students in their final year.

Fall or winter semester — as arranged.

**CS420: Organic Environmental Analysis (S)**

Instructor: **Prof. Hoyle**

*Prerequisite:* CS205

This course has limited enrolment and is offered in alternate years. The course will involve the study of the analytical chemical techniques used in the analysis of environmental samples obtained from the atmosphere, hydrosphere and lithosphere. Included in this study will be sampling methods used for air, water, soil, food and wastes, and modelling of environmental contamination. In addition, government regulations, hazard assessment and public awareness of these issues will be discussed.

Fall semester — 2 lecs and 4 labs. Offered in alternate years; not offered in 1995–96.

**CS425: Special Topics in Chemistry and Soil Science II (A)**

Instructors: **Chemistry and Soil Science Staff**

*Prerequisite or corequisite:* CS415

An optional course for Agricultural Chemistry and Soil Science students who want to do a second in-depth study of a special topic in their final year. The topic selected by a student may be in a similar area of interest to that studied in CS415 but must pertain to a distinctly different aspect of that field of Chemistry or Soil Science. Course material will be arranged with Chemistry and Soil Science faculty. This course will involve special tutorials, assigned readings and independent lab work where appropriate.



**CS430: Soil Survey and Land Evaluation (A)**

Instructor: **Prof. Brewster**

*Preparatory:* CS325

Principles of the field study and mapping of soils as well as the more general land evaluation techniques including land classification based on inherent characteristics, present land use/land cover, and land capabilities for alternative uses. Preparation of soil, land use, and other interpretive maps in association with the interpretation of aerial photographs and methods of soil cartography. There is a mandatory field component.

Fall semester — 3 lecs and 4 labs per week. Offered in alternate years; not offered in 1995–96.

**CS440: Environmental Soil Chemistry**

Instructor: **Prof. Warman**

*Prerequisites:* IN100, IN101

Chemical composition of soils (soil acidity, oxidation-reduction, ion exchange, adsorption-desorption reactions, clay mineralogy and organic matter transformations) in the context of environmental soil chemistry. Labs and seminars-discussions integrate basic soil chemical principles with problems in waste disposal, metal contamination, nutrient leaching, pesticide degradation, etc.

Winter semester — 3 lecs and 4 labs per week. Offered in alternate years; offered in 1995–96.

**CS449: Project-Seminar I (A)**

Coordinator: **Prof. Warman**

A required course for all Agricultural Chemistry and Soil Science students. Each student will be assigned a research project requiring library and laboratory investigative procedures. Each student will present periodic oral reports and a written report on the subject of investigation. Other written and seminar topics may be assigned.

Fall semester — 1 scheduled seminar session per week.

**CS450: Project-Seminar II (A)**

Coordinator: **Prof. Warman**

A continuation of CS449. Students will continue with their projects and will present an undergraduate thesis as well as a final conference-style seminar presentation. Other assignments may be given.

Winter semester — 1 scheduled seminar session per week.



## **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.

Winter semester — 2 lecs and 4 labs per week.

### **EB10: Accounting**

Instructor: **Prof. Arnfast**

An introduction to accounting topics useful to managers. Topics include recording transactions, forms of business organization, cash and accrual basis of accounting, financial statements, internal control, payrolls, bank reconciliation, and types of accounting systems with an introduction to microcomputer applications.

Fall semester — 3 lecs per week.

### **EB11: Applied Accounting and Taxation**

Instructor: **Prof. Arnfast**

*Prerequisite:* EB10

The basic principles and procedures relevant to the accounting function of a business. Topics discussed include recording business transactions, year-end adjustments, and preparation of financial statements. Considerable time will be spent on Canadian income tax.

Winter semester — 3 lecs and 2 labs per week.

### **EB12: Macroeconomics**

Instructor: **Prof. Tait**

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

Fall semester — 3 lecs per week.

**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 behaviour, supplier behaviour, market structures, price determination, marketing boards, and marketing commissions.

Fall semester — 2 lecs and 3 labs per week.

**EB41: Business Law**

Instructor: **Prof. Arnfast**

Introduces several legal topics relevant to the management of a business. Topics discussed are: legal structure in Canada, Law of Torts, contracts, sale of goods, consumer protection legislation, creditors, employment, forms of business organization, insurance, and real estate.

Winter semester — 3 lecs per week.

**EB42: Applied Farm Management**

Instructor: **Prof. Tait**

Designed to transfer classroom teaching to real farm situations. Students have an opportunity to apply the principles of farm management on production farms. Some of the requirements involve analyzing farm records, credit analysis, developing farm plans, and evaluating machinery, livestock, and crop decisions, based on actual farm cases.

Winter semester — 2 lecs and 4 labs per week.

**EB65: Business Project**

Coordinator: **Prof. Tait**

An opportunity to examine, in detail, specific agricultural topics of interest. Projects are organized and carried out by the students under the supervision of various staff members.

Fall semester — 5 labs per week.

**EB70: On-Farm Training**

Coordinator: **Prof. Tait**

The 7-month training takes place on a commercial production unit, where the student is under the direct supervision of the farmer. Emphasis is placed on having the student involved in all facets of the operation, with particular attention to financial management. Each student is expected to take part in selecting his/her training farm. Whenever possible the farm will be in the province chosen by the student. The final grade in the course is based on the student's performance in several topic areas (financial, production and specific skills) as determined by both the farmer and the coordinator.

May–November at the end of the second year.

**EB72: Farm Project**

Coordinator: **Prof. Tait**

The farm project relates the course program to the on-farm training. It stresses the application of information to a specific farm situation. For this project, the farm may be the home farm or any other farm. An intimate knowledge of the farm is necessary. The student, therefore, must have access to the farm and to detailed information about it.

The prepared project consists of three sections: an analysis of the present farm operation, including a detailed inventory of land, buildings, machinery, and all other farm resources; an outline of the student's objectives and projected plans for the farm; and a practical step-by-step (year-by-year) program for the changes necessary to reach these goals.

The farm project is introduced in the first technology year, before the beginning of the seven months of on-farm training. All the required data for the farm inventory are collected during the on-farm training period. The final work on the prepared project is done in the last college semester. Though most of the work is done outside of the scheduled class time, one afternoon per week is scheduled for special instruction and for presentations. Each student is required to present a minimum of one seminar on his or her farm plan to the project class and the instructor committee.

Winter semester — 5 labs per week.



**EB90: Technology Project**

Coordinator: **Prof. Tait**

This project provides an opportunity for the students to study in detail an Economics and Business topic of special interest. This must be a new topic, but may build on other aspects of the study program. The student pursues studies under a project supervisor. The project plan developed with the advisor must include the purpose of the study, the procedures and materials used, a time schedule for the work involved, the method 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.

**EB200: Microeconomics I (E)**

Instructor: **Prof. Stackhouse**

*Prerequisites:* IN100, IN101, MP100

Introduces the principles of neoclassical microeconomic theory using graphical and mathematical analysis. Areas of emphasis include: the competitive market model, measurement and interpretation of elasticities, the theory of consumer preferences, and the theory of production.

Fall semester — 3 lecs per week.

**EB205: Microeconomics II (E)**

Instructor: **Prof. Stackhouse**

*Prerequisites:* EB200, EB260

A continuation of the principles presented in Microeconomics I. This course examines the theory of the firm under perfect and imperfect market conditions, and general equilibrium of production and exchange. These principles are presented using graphical and mathematical analysis.

Winter semester — 3 lecs per week.

**EB210: Financial Accounting I (E)**

Instructor: **Prof. Arnfast**

A study of the basic principles and procedures relevant to the accounting function of a business firm. Topics discussed include recording transactions, adjusting entries and preparing financial statements, accounting for a merchandising concern, accounting systems with emphasis on microcomputer, accounting for cash, credit sales and accounts receivable, inventories and cost of goods sold, plant and equipment.

Fall semester — 3 lecs and 2 labs per week.

**EB215: Financial Accounting II (E)**

Instructor: **Prof. Arnfast**

*Prerequisite:* EB210

Continues the study of financial accounting with emphasis on special topics and reporting of accounting information. Includes a brief introduction to income tax.

Winter semester — 3 lecs and 2 labs per week.

**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:* IN100, IN101, MP100

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 and one tutorial 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.

**EB320: Agricultural and Food Policy I**

Instructor: **Prof. Dunlop**

*Prerequisites:* IN100, IN101 or consent of instructor.

This course introduces students to the structure of the agri-food industry and the process of policy making in the agri-food industry. Through lectures and guest speakers, students will learn how policies are developed and who is involved in the policy development process. Also the governmental and socio-economic systems that enact and regulate policy will be examined.

Winter semester — 3 lecs and 2 labs 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.

**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. Clark**

An introduction to the study of macroeconomics. The course is designed to acquaint the student with the main elements of macroeconomic theory. Emphasis is placed on the application of theories to current Canadian economic problems. Topics covered include national income analysis, monetary policy, and fiscal policy.

Winter semester — 3 lecs per week.

**EB360: Econometrics (E)**

Instructor: **TBA**

*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: **TBA**

*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.

**B405: Macroeconomics II (E)**

Instructor: **Prof. Grant**

*Prerequisite:* EB355

Development of an integrated aggregate model of the Canadian economy, which includes consideration of money, product, and labour markets, and aggregate demand and supply.

Winter semester — 3 lecs per week.

**EB415: Business Law (E)**

Instructor: **Mr. Hunt**

An introduction to general principles of law relating to the management of a business. Major areas studied are torts and contracts. Specialized topics include forms of business organizations, sale of goods, conditional sales, real property, mortgages, insurance, and wills.

Fall semester — 3 lecs per week.

**EB420: Agricultural and Food Policy II (A)**

Instructor: **Prof. Dunlop**

*Prerequisites:* EB320, 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 and 2 labs per week.

**EB425: Research Methods (E)**

Instructor: **Prof. Grant**

*Prerequisites:* EB325, EB360

The lectures cover general methodological issues within economics, specific analytical methods utilized by agricultural economists, as well as principles and guidelines for researching and writing fourth-year projects. It is required that progress on the fourth-year project (to be completed in EB450) include a precise statement of the topic, a literature review, a detailed outline, a well-defined methodology, and demonstration of data availability.

Fall semester — 2 lecs and 2 labs per week.

**EB430: International Marketing (E)**

Instructor: **Prof. Whalen**

*Prerequisites:* EB335 or permission of instructor

This course provides an introduction to international marketing and the international trading system. Students will be exposed to the unique aspects of international market research, selection, entry, pricing, and communications which differentiate them from their domestic equivalents. In addition the international trading system will be examined with an emphasis on institutions, such as the GATT, the IMB and international commodity agreements, which directly impact the movement of goods and services. Cases are used extensively in the course and class participation is vital.

A maximum of 25 students will be admitted to the course.

Winter semester — 3 hours per week (two sessions of 1.5 hours each). First offered— Winter 1994.

**EB435: Consumer Behaviour and Food Marketing (E)**

Instructor: **Prof. Whalen**

*Prerequisite:* EB335 or permission of instructor

The course introduces the student to the basics of consumer behaviour and then applies this knowledge to the food marketing system. Topics covered include external influences on consumer behaviour, motivation, perception, learning, and decision making. Historic and recent trends in product marketing, pricing, and advertising also form part of the course. Cases are used extensively and class participation is vital.

A maximum of 25 students will be admitted to the course.

Fall semester — 3 hours per week (two sessions of 1.5 hours each). First offered— Fall 1994.

**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.



**EB450: Project-Seminar (E or A)**

Instructors: **Dept. of Economics and Business Management Faculty**

Coordinator: **Prof. Grant**

*Prerequisite:* EB425

Under the supervision of faculty, students complete the research projects begun in EB425. The student is required to submit the first draft for evaluation by faculty. The student presents a final report and participates in peer evaluation of the presentations of the other students.

Winter semester — 2 seminars per week.

## **Humanities**

**H01: Language Development**

Instructor: **Prof. Sanger**

Designed to ensure that pretechnical students have an adequate grounding in grammar, spelling, and punctuation to meet the requirements for admission to H10 Technical Writing; that they get exercise in technical communication; and that they have the opportunity to read and write about Canadian history and literature. The course consists of classroom instruction in grammar, spelling, and punctuation. There is heavy emphasis on the writing of tool and machine descriptions, notetaking, letter writing, and essays. At least two Canadian novels are studied. There is one major term paper and a final examination. H01 is not equivalent to H10.

Winter semester — 3 lecs per week.

**H10: Technical Writing**

Instructor: **Prof. Sanderson**

Objective is to provide instruction in basic scientific report and review paper writing; in grammar and spelling; in business letter writing with specific reference to the employment application letter and resume; and in the cultural, social, and historical background of agriculture and its related trades. Students must write a major term paper. H10 is not equivalent to H100.

Fall semester — 3 lecs per week.

**H45: Technical Communications**

Instructor: **Prof. Sanderson**

This course will focus on improving interpersonal communication skills. It will be designed specifically for students planning careers where contact with the public is essential. This course will deal with such topics as listening and interviewing skills, group dynamics, conflict management, meeting management, and basic teaching skills. Evaluation for the course will be based primarily on projects. This course would be open to all technicians with a maximum of 20 students registered. This course is required for students in the Animal Health Technology program.

Winter semester — 1 lec and 2 labs per week.

**H50: Core Language Skills**

Instructor: **Prof. Sanger**

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

This is a non-credit course 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 course has limited enrolment.*

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.

### **H101: The English and American Novel**

Instructor: **TBA**

This course examines four or five English and American novels, considering in both as literature and as reflections of the cultural situation of their age. Novels, for example, by Defoe, Samuel Johnson, Mary Shelley, Dickens, Melville, Emily Bronte, James Joyce, Willa Cather or Nathanael West may be among those chosen. Students must write a major term paper based upon thorough library research.

Course enrolment is limited to 85.

Winter semester — 3 lecs per week.

### **H102: Nature in English and American Literature**

Instructor: **Prof. Sanger**

This course discusses the role of nature in various philosophies of nature in English and American literature. Poems, novels, autobiographical works, and essays by authors such as, for example, Izaak Walton, Gilbert White, William and Dorothy Wordsworth, Coleridge, Emerson, Thoreau, Whitman, John Muir, Hopkins, Thomas Hardy, D.H. Lawrence, Edward Thomas, E.B. White, Wendell Berry, John Haines, Barry Lopez, or Annie Dillard may be among those chosen for study. Students must write a major term paper based upon thorough library research.

Course enrolment is limited to 85.

Fall semester — 3 lecs per week.

### **H130: Introductory French (H)**

Instructor: **TBA**

*Prerequisite:* Grade 12 High School French or permission of instructor and Head of Department

This course is designed to provide the student with opportunities to actively use the language through various socio-cultural settings and language functions. As part of a communicative approach, a video production component centered on publicity will be integrated in the program.

A variety of culturally relevant authentic materials such as video recordings, audio-cassettes, guest speakers, and literature will be used to supplement the text book and to facilitate learning through reading, writing, and listening skills. This course is designed for anglophone students or for students whose French is being learned as a foreign language.

Winter semester — 3 lecs per week.



**H135: Basic Spanish I**

Instructor: **TBA**

This course is designed to offer an initial competency in spoken and written Spanish. Comprehension, reading, writing, and conversation are encouraged throughout the course. An introduction to basic grammar is offered. Anglophone, francophone, and international students are encouraged to take this course. Students whose first language is Spanish will not be eligible. This course will be offered subject to sufficient enrolment.

Fall semester — 3 lecs per week.

Text — Jarvis, A. C; Lebrede, R, and Mena, F. 1990. *Cómo se dice?* (4th edition), Student edition, with cassette Workbook/Laboratory Manual.

**H136: Basic Spanish II**

Instructor: **TBA**

*Prerequisite:* Basic Spanish I

This course is designed for anglophone, francophone and international students. It is a continuation of Basic Spanish I with emphasis on comprehension, conversation, reading and writing.

This course will be offered subject to sufficient enrolment.

Winter semester — 3 lecs per week.

Textbook: Jarvis, A. C; Lebrede, R, and Mena, F. 1990. *Cómo se dice?* (4th edition), Student edition, with cassette Workbook/Laboratory Manual.

**H140: Personnel Management (E)**

Instructor: **TBA**

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

Winter semester — 3 lecs per week.

**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.

**H160: Introductory Sociology (H)**

Instructor: **Prof. Beesley**

An introduction to the field of modern sociology. Themes addressed in the course are sociological theory and method, social process, social organization, social institutions, social differentiation, and social change. Discussion will include social issues, e.g., rural-urban conflict, an aging society, and family changes. Some emphasis will be given to rural social problems.

Fall semester — 3 lecs per week.

**H170: Introductory Human Geography (H)**

Instructor: **Prof. Beesley**

This course is an introduction to the field of Human Geography. The objectives of the course are to present the spatial point of view on human-land interactions. Lectures, readings, and assignments consider geographical patterns, processes and problems in rural and urban settings. Some emphasis will be given to the Canadian and Atlantic region contexts.

Winter semester — 3 lecs per week.

**H205: Canadian Studies (H)**

Instructor: **Prof. Sanger**

Objectives of this course are to provide a general survey of Canadian literature from colonial times to the present and to examine specifically four or five 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.

**H230: Nature's Image: A Survey of Landscape Art (H)**

Instructor: **Ms. Klee-Atlin**

*Prerequisites:* H10 or H100 or by permission of Head of Humanities Department.

This course will provide an introduction to the history of artforms depicting landscape with the major focus being on landscape painting. The course will consist of both art history lectures and a studio component in which drawing techniques, collage, and color theory will be explored. Students will develop skills in composition and will gain an increased appreciation for landscape art traditions.

Fall semester — 3-hour lecture/studio, once per week.

**H300: History of Agriculture (H)**

Instructor: **Prof. Sanger**

Objective of this course is to examine the development of agriculture from the 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; times arranged by the instructor and student.

**H305: History of Scientific and Agricultural Thought (H)**

Instructor: **Prof. Sanger**

The objective of this course is to examine some of the key texts 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 16th to 20th centuries. One of the main themes of the course will be the nature of scientific discovery and cognition. Another will be the place of humankind in nature. In addition to a final exam, students must either write one major term paper or submit an acceptable journal of natural observations.

Fall semester — 3 seminars per week.



**H320: Extension Education in the Rural Community (H)**

Instructor: **Prof. Sanderson**

*Prerequisite:* 20 degree subjects or approval of the instructor.

The aim of this course is to provide students with a basic understanding of the principles and theories of extension education in rural society. The first part of the course will discuss trends in the rural community 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**

*Prerequisite:* 20 degree subjects including H200, or 12 technical subjects. Technician students require H10.

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

Winter semester — 3 lecs and 2 labs per week.

**H350: Environmental and Agricultural Ethics (H)**

Instructor: **M. Campbell**

*Prerequisites:* H100, or by permission of Instructor and the Head of the Humanities Department.

This course offers a general introduction to environmental ethics with emphasis upon agricultural issues. Students will be introduced to modern ethical theory, and to techniques of philosophical reasoning and will be provided with a general context for overall discussion by examining the origins of the modern world view (the rise of modern science, market economics, and liberalism). Evaluation will be based upon class participation and a series of short weekly essays based upon directed readings and field experience. Essay-style midterm and final exams are required.

Winter semester — 1 seminar, 2 hours per week.

**H360: Rural Sociology (H)**

Instructor: **Prof. Beesley**

*Prerequisites:* H160 and H100, or permission of the instructor.

This course provides a focus on rural sociological themes, particularly in the Canadian and Atlantic region context. Themes addressed include the theory and nature of rural social change, rural communities and response to forces of change, problems and issues in rural society (e.g. crime, aging, health care), environmental issues and their links to society, and the social implications of economic and political change for rural Canada.

Winter semester — 3 hour seminar per week.

**H370: Rural Geography (H)**

Instructor: **Prof. Beesley**

*Prerequisites:* H170 and H100, or permission of the instructor.

This course focuses on rural geographic problems in Canada and the Atlantic region. Discussion will include, for example, rural land use issues, settlement dynamics, rural resource problems, urban-rural interaction, agricultural change, rural-well being, and rural planning. The geographic perspective emphasizes spatial variability and human-land interactions.

Fall semester — 3 seminar hours per week.

**H401: Humanities Research Seminar I**

Instructor: **Humanities Faculty, as appropriate to research topics**

*Prerequisites:* At least 30 degree-course credits

This course is designed to serve as an opportunity for senior students with interests in Humanities related subjects to explore particular research topics in some depth. Research projects will emphasize one or more of the following themes: Rural Life in Literature, Rural and Agricultural History, Agricultural and Environmental Philosophy, Agricultural and Rural Environmental Issues. The course will require seminar presentation(s), and written work (e.g. an annotated bibliography and a literature review paper). The literature review must be a substantial paper able to stand alone as a research document, and will comprise a major component of the course evaluation. Students will work under the supervision of individual Humanities Department faculty, but will present their seminars to a wider audience.

Fall Semester — Meeting schedule to be arranged.



**H402: Humanities Research Seminar II**

Instructor: **Humanities Faculty, as appropriate to research topics**

*Prerequisites:* H401

This course is designed as a sequel to H401 for senior students with major interests in Humanities related subjects. Research projects, as for H401, will emphasize one or more of the following themes: Rural Life in Literature, Rural and Agricultural History, Agricultural and Environmental Philosophy, Agricultural and Rural Extension Education, Rural Sociology, Rural Geography, Rural Environmental Issues. The second (winter) semester will require seminar presentations(s), and written work (e.g., a substantial research paper). The research paper will be an original contribution to the selected area of research, developed from the work initiated in H401. Students will work under the supervision of individual Humanities Department faculty, but will present their seminars to a wider audience.

Winter semester — Meeting schedule to be arranged.

## **Interdepartmental**

**IN100: Agriculture and Food I (A)**

Coordinator: **Prof. Brewster**

*Equivalent to two single semester courses.*

This course is an introduction to agriculture and food systems. The principles of animal science, plant science, agricultural engineering, soil science, economics, and business will be integrated in a case-oriented, problem solving approach. Students will work together in small groups to acquire a relevant knowledge base that is useful in future settings. The use of “real life” cases relevant to students’ experience will provide a context for the study of other courses in the B.Sc. (Agr) program.

Along with the goal of providing the students with a knowledge of the application of science to agriculture, this course will assist students to understand the integrated nature of agriculture and food systems in both regional and global contexts. Associated course goals are to develop communication and independent learning skills and the ability to function effectively in team situations, and to stimulate students to think critically, logically, and quantitatively, while respecting the ideas and values of others.

Fall semester — 3 lecs, 4 tutorials and 2 section meetings per week.



**IN101: Agriculture and Food II (A)**

Coordinator: **Prof. Brewster**

*Equivalent to two single semester courses.*

A continuation of IN100.

Winter semester — 3 lecs, 4 tutorials and 2 section meetings per week.

**IN400: Issues in Agriculture (S)**

Coordinators: **TBA**

*Prerequisite:* 3rd- or 4th-year standing, or permission of coordinators. This course will have a limited enrolment (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. Offered in alternate years; not offered in 1995–96.

## **Mathematics and Physics**

**MP01: Pre-Tech Mathematics**

Instructor: **Mrs. D. Robinson**

Mathematical concepts are applied to problems in agriculture. Topics are mathematical operations, percentage, linear and simultaneous equations, quadratic equations, exponents, logarithms, math of finance, ratio, proportion, and variation. The SI system of units is used.

Winter semester — 2 lecs and 2 labs per week.

**MP14: Computational Methods**

Instructor: **Prof. Farmer**

A course to develop problem-solving and decision-making abilities and computational skills, both manual and machine. The course is based around the computer. The problems are of a scientific and managerial nature, emphasizing agricultural applications. The arithmetic and algebraic skills needed for the course are developed as the need arises through self-instructional modules.

Winter semester — 3 lecs and 2 labs per week.

**MP15: Introductory Physics**

Instructor: **Prof. Pearson**

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

Fall semester — 3 lecs and 2 labs per week.

**MP70: Basic Statistics**

Instructor: **D. Montgomery**

Populations and samples, frequency distributions, sampling theory, tests of hypotheses, linear regression and correlation, analysis of variance, and discussion of experimental designs.

Winter semester — 3 lecs per week.

**MP80: Transition Mathematics**

Instructor: **Mrs. D. Robinson**

This is a review of high school mathematics. Topics include manipulation of algebraic expressions, equation solving, linear and quadratic functions, trigonometric functions, graphing, inverse functions and specifically logarithmic and exponential functions, sequences, and series. This course will be conducted on a lecture/tutorial basis. A non-credit course.

Fall semester — 4 lecs per week.

**MP90: Introductory Physics**

Instructor: **Prof. Pearson**

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: **Prof. Madigan and TBA**

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

A study of limit and the derivative, with maxima and minima, velocity and acceleration, and differentiation of the trigonometric, exponential, and logarithmic functions. Topics from analytic geometry are covered at appropriate stages throughout the course. Students are required to confirm their eligibility for admission to this course by means of a mathematic diagnostic test, to be taken the day following registration. Students not admitted must take MP80.

Both semesters— 4 lecs per week.

Text — Stewart, *Calculus*.

**MP105: Calculus and Analytic Geometry II (M)**

Instructors: **Prof. Madigan and TBA**

*Prerequisite:* MP100

A continuation of MP100 dealing mainly with the integral calculus. Both definite and indefinite integrals are studied, with application to areas, volumes, hydrostatic pressure, and work. As in the case of MP100, topics from analytic geometry are covered at appropriate stages of the course.

Both semesters— 4 lecs per week.

Text — Stewart, *Calculus*.

**MP130: Physics for Life Sciences I (S)**

Instructor: **Prof. Pearson**

*Prerequisite:* University Preparation Grade XII Physics (N.S. 441, N.B. 121 or 122) or NSAC MP90.

Basic physics principles necessary for the understanding of instrumentation and biophysical topics form the core of the course. Topics include mechanics, motion and force, concepts of energy, pressure, and fluid flow. Calorimetry and heat transfer methods are applied to such topics as the basic metabolic rate and size of an animal.

Both semesters— 3 lecs and 4 labs per week.

Text — Haliday, Resnick, *Physics*.



**MP135: Physics for Life Sciences II (S)**

Instructor: **Prof. Pearson**

*Prerequisite:* MP130

A continuation of Physics MP130. The electric charge, field and potential and simple electric circuits are taken up, and their importance in instrumentation is explored. The magnetic field is included. Elementary optics and optical instruments are studied.

Both semesters— 3 lecs and 4 labs per week.

Text — Haliday, Resnick, *Physics*.

**MP200: Statistics (M)**

Instructor: **TBA**

Descriptive statistics; exploratory data analysis; probability; normal, binomial and chi-square distributions; tests of significance; t and F distributions, linear regression and correlation; sampling; planning of experiments; analysis of variance, means comparison tests.

Winter semester — 3 lecs, tutorial, and computer lab per week.

**MP220: Computer Science (M)**

Instructor: **Prof. Bishop**

Introduction to problem-solving methods and algorithm development. Emphasis is on designing, coding, debugging, and documenting programs, using FORTRAN.

Fall semester — 3 lecs and 2 labs per week.

**MP222: Computer Methods (M)**

Instructor: **Prof. Farmer**

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

Both semesters— 3 lecs and 2 labs per week.

**MP230: Multivariable Calculus (M)**

Instructor: **Prof. 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. Havard (Agricultural Engineering)**

*Prerequisite:* MP135

Includes theory of circuits and power engineering; DC circuits; AC currents and voltages, phasors and complex algebra; AC circuits; current-voltage; power; frequency response; polyphase circuits; transients; magnetic circuits; si phase transformers; electrical machinery; DC machines; alternators; induction and synchronous motors.

Fall semester — 3 lecs and 2 labs per week.

Text — Irwin, *Basic Engineering Circuit Analysis*.

**MP320: Statistical Methods (M)**

Instructor: **D. Montgomery**

*Prerequisite:* MP200

Covers methods of analysis of variance and covariance, experimental designs, sampling techniques, multiple regression, and correlation.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; not offered in 1995–96.

**MP330: Agrometeorology (A)**

Instructor: **TBA**

*Prerequisite:* MP130

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

Winter semester — 3 lecs and 2 labs per week.

## **Plant Science**

**PS30: Introduction to Plant Science**

Instructor: **Prof. Goodyear**

A survey course to introduce students to the principles and practices involved in the production of crop plants. Labs will give the students an opportunity to become familiar with the skills and techniques involved in growing agronomic and horticultural crops.

Winter semester — 3 lecs and 2 labs per week.

Text — Barden, Halfacre and Parish, *Plant Science*.

**PS36: Field Crops**

Instructor: **Mr. Lewis**

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.

**PS37: Field Crop Management**

Instructor: **Prof. Martin**

*Preparatory:* PS30 or CS12

A study of the production management of forage and grain crops. Soil conservation, crop rotations, and other multiple cropping systems are assessed. The course will provide a basis for sound feed-production decisions on Atlantic livestock farms and the ability to critically read publications pertaining to field crop management.

Winter semester — 3 lecs and 2 labs per week.



**PS38: Nursery Crop Production**

Instructor: **Prof. Mapplebeck**

The course examines site selection; types of nurseries; nursery layout, facilities and equipment; and the production of field-grown and container-grown nursery stock. Proper handling of nursery stock by retailers, and selling of nursery stock through garden centres are also covered.

Winter semester — 3 lecs and 2 labs per week.

**PS39: Greenhouse Crop Management**

Instructor: **Prof. Mapplebeck**

This course covers site selection, types of greenhouses, heating systems, ventilation, growing media, watering and fertilization, environmental controls in the greenhouse, and the production of bedding plants, pot plants, cut flowers, and greenhouse vegetables. The laboratory section of this course includes visits to commercial greenhouse operations and practical experience in the College greenhouse.

Fall semester — 3 lecs and 2 labs per week.

Text — Nelson, *Greenhouse Operation and Management*.

**PS43: Small Fruit Crops**

Instructor: **Prof. Ju**

Berry crops studied include strawberries, raspberries, cranberries, blueberries, currants, gooseberries, grapes, and kiwis. All aspects of berry production, from planting to marketing, are covered. Course also includes visits to small fruit farms and certified strawberry nurseries.

Fall semester — 3 lecs and 2 labs per week.

**PS44: Tree Fruit Crops**

Instructor: **Prof. Ju**

The culture and handling of apples, pears, peaches, plums, and cherries. Topics studied are soil management, propagation, training systems, pruning, harvesting, pest control, grafting and budding, storage, and marketing.

Winter semester — 3 lecs and 2 labs per week.

**PS47: Turfgrass Production and Management**

Instructor: **Prof. Daniels**

A study of cool-season turfgrasses, their characteristics, and proper usage. The establishment, maintenance, and renovation of turfgrass will be studied. Cultural topics covered will emphasize proper fertilizing, watering, and pest control.

Fall semester — 3 lecs and 2 labs per week.

**PS49: Potato Production**

Instructor: **Prof. Goodyear**

Cultural practices involved in the production are discussed in relation to the botanical characteristics of the potato plant. Physiological changes involved in sprouting, tuber initiation, crop development, and storage are considered in detail. Seed potato production is given particular attention.

Winter semester — 3 lecs and 2 labs per week.

**PS50: Landscape Horticulture I**

Instructor: **Prof. Goodwin**

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

Fall semester — 3 lecs and 4 labs per week.

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

**PS51: Residential Landscape Design and Construction**

Instructor: **Prof. Higgins**

*Prerequisites:* AE12, PS50, PS60

Residential landscape design and construction are studied. A systematic and practical approach to design is emphasized. Sketching is a component of this course.

Winter semester — 3 lecs and 4 labs per week.

Text — Hannebeum, *Landscape Design*.

**PS53: Vegetable Production**

Instructor: **Prof. Goodyear**

Production practices for vegetables grown in the Atlantic region are studied in detail, including botanical and horticultural characteristics, soil and fertility requirements, cultivar selection, pest management, and harvesting and storage. Commercial vegetable enterprises are visited.

Fall semester — 3 lecs and 2 labs per week.

Text — Swiader, Ware and McCollum: *Producing Vegetable Crops*.

**PS55: Plant Propagation**

Instructor: **Prof. Nowak**

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 structures, containers, media, and sanitation, pedigreed seed production, and *in vitro* techniques for micropropagation are also components of this course.

Fall semester — 3 lecs and 3 labs per week.

Text — Hartmann, Kester and Davis, *Plant Propagation*.

**PS60: Landscape Plant Materials I**

Instructors: **Profs. Higgins and Olson**

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**

Instructor: **Prof. Higgins**

Landscape plant materials are studied with respect to their identification. Broad-leaf and narrow-leaf evergreens and annuals are studied. Recognition of deciduous trees by winter wood characteristics is also covered.

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 learn principles of agricultural experimentation and are evaluated on initiative in developing the project and on quality of oral and written reports. The work should commence in the Fall semester.

Both semesters— 2 lecs per week.

**PS70: Landscape Techniques**

Instructor: **Prof. Goodwin**

*Prerequisites:* PS47, PS51

This is a Spring semester course. Students will be required to work under contract in the landscape horticulture trade with an approved employer for a period of at least 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.

Summer and Fall— 6 weeks.

**PS71: Arboriculture**

Instructor: **Prof. Goodwin**

*Prerequisite:* PS50

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

Fall semester — 3 lecs and 4 labs per week.

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

**PS72: Landscape Maintenance**

Instructor: **Prof. Goodwin**

*Prerequisites:* AE38, PS47, PS50

Provides an overview of site management. Time studies, scheduling of horticultural work and management techniques are included. Pesticides and their application are discussed, and provincial pesticide applicators exams are written in preparation for licensing. A calendar of landscape maintenance tasks will be developed by the student.

Winter semester — 3 lecs and 2 labs per week.

**PS73: Landscape Horticulture II**

Instructor: **Prof. Higgins**

*Prerequisites:* PS51, PS61

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

Fall semester — 3 lecs and 2 labs per week.

**PS74: Landscape Design and Construction**

Instructor: **Prof. Higgins**

*Prerequisite:* PS73

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

Winter semester — 3 lecs and 3 labs per week.

**PS76: Plant Products Physiology**

Instructor: **Prof. Asiedu**

*Corequisite:* B41

The principles of plant physiology as they apply to plant products in storage environments. Course deals with management practices associated with the harvesting and storage of crops and the effect of time period and conditions of storage on the quality of the plant products. Storage structures are studied and representative types of commercial storages visited.

Winter semester — 3 lecs and 2 labs per week.

**PS90: Technology Project**

Instructor: **Prof. Nowak**

This project provides an opportunity for the student to study in detail a Plant Science topic of special interest. The topic 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 reported in the student's final semester, but studies should commence early in the first semester.

Fall and Winter semesters— 2 lecs per week.

**PS147: Farm Woodlot Management (A)**

Instructor: **TBA**

*This course has limited enrolment.*

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.

**PS200: Vegetable Crops (A)**

Instructor: **TBA**

*Prerequisites:* IN100, IN101, 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. Offered in alternate years; not offered in 1995–96.

Text — Swiader, Ware and McCollum: *Producing Vegetable Crops*.



**PS210: Principles of Organic Horticultural Crop Production (A)**

Instructor: **Prof. Goodyear**

*Prerequisites:* IN100 and IN101, or PS30

Study of the principles that form the basis for organic production systems. Special attention is given to soil fertility, organic soil amendments, compost and mulches, crop rotation, plant health, management of diseases and pests, companion planting, produce storage/handling and marketing. Seminar topics will include making the transition to organic production and definition and legislation of organic food in Canada.

Fall semester — 3 lecs and 3 labs/seminars per week.

**PS300: Forage Crops (A)**

Instructor: **Prof. Martin**

*Prerequisites:* IN100, IN101

*Preparatories:* B260, B265

Study of principle characteristics and requirements of forage crops, and the production of forages for pasture, hay, silage, cover crops, or green manure. Emphasis will be given to forages in multiple cropping systems and rotational grazing systems and the ability to critically read publications pertaining to forage crops.

Winter semester — 3 lecs and 2 labs per week. Offered in alternate years; offered in 1995–96.

**PS305: Grain Production (A)**

Instructor: **Prof. Caldwell**

*Prerequisites:* IN100, IN101, 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. Offered in alternate years; not offered in 1995–96.  
Text — Stoskopf, *Cereal Grain Crops*.

**PS315: Tree Fruit Crops (A)**

Instructor: **Prof. Ju**

*Prerequisites:* IN100, IN101, 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.

Winter semester — 3 lecs and 2 labs per week. Offered in alternate years; offered in 1995–96.

**PS320: Small Fruit Crops (A)**

Instructor: **Prof. Ju**

*Prerequisites:* IN100, IN101, 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.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; not offered in 1995–96.

**PS325: Potato Production (A)**

Instructor: **Prof. Asiedu**

*Prerequisites:* IN100, IN101, 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:* IN100, IN101, B100

*Preparatories:* B260, B265

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

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; offered in 1995–96.

**PS335: Landscape Plant Production (A)**

Instructor: **Prof. Mapplebeck**

*Prerequisites:* IN100, IN101, 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. Offered in alternate years; not offered in 1995–96.

**PS340: Turfgrass Management Principles and Practices (A)**

Instructor: **Prof. Daniels**

*Prerequisites:* IN100, IN101, B100

A study of the most current practices employed in the production of commercial turf. Emphasis is placed on the scientific principles involved in the maintenance of turf in intensively used areas.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; not offered in 1995–96.

**PS350: Plant Biochemistry (A)**

Instructor: **Prof. Nowak**

*Prerequisites:* B260, CS200

A study of plant metabolism in crop management systems. Carbon and nitrogen metabolism in relation to nutrition and environmental stresses will be the main focus of this course.

Plant-microbial interaction and molecular approaches for the manipulation of developmental processes in plants will also be considered. The course will alternate with PS475.

Winter semester — 2 lecs and 3 labs per week. Offered in alternate years; offered in 1995–96.



**PS355: Tropical Agriculture (A)**

Instructor: **Prof. Asiedu**

*Prerequisites:* IN100, IN101

This course will introduce the student to food production, storage, and handling systems in tropical and sub-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

An introduction to the principles and practices of plant breeding, including the genetics of agriculturally important traits, germplasm preservation, breeding biotechnology, and the structure of the Canadian seed industry.

Winter semester — 3 lecs and 2 labs per week. Offered in alternate years; offered in 1995–96.

**PS405: Agronomy (A)**

Instructors: **Prof. Caldwell**

*Prerequisites:* PS300, PS305 and PS415

The objective is to review and integrate material from prerequisite subjects on field crop production, soils, climate, and basic sciences into crop management systems. Students successfully completing this course will qualify to be identified as agronomists.

Winter semester — 3 lecs per week.

**PS410: Horticulture (A)**

Instructors: **Prof. Daniels**

*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:* One crop production course

*Preparatory:* B260

The course is designed to stimulate interest, critical thinking and investigative processes for the understanding of crop adaptation to abiotic influences such as light, soil and water and biotic factors such as other plants, mycorrhizae, and *Rhizobia*. Agronomic practices will be related to social and environmental responsibilities.

Fall semester — 3 lecs and 2 labs per week.

Texts— Gardener et al., *Physiology of Crop Plants*. Gayton, *The Wheatgrass Mechanism*.

**PS449: Plant Science Project-Seminar I (A)**

Coordinator: **Profs. Daniels and Atlin**

Involves the selection of an appropriate project and the preparation of a research plan to investigate the chosen subject. Fundamentals of experimental design and data analysis are covered in lectures. Under the supervision of a faculty advisor, each student will select a topic, conduct a detailed literature review, and prepare an experimental plan for implementation in PS450. This course is required by all students in the Plant Science option. The research project and faculty advisor are to be chosen in consultation with the course coordinator during Semester VI, and work initiated soon thereafter. This course is required by students in Year 3 of the Plant Science option.

Winter semester — 2 lecs per week.

**PS450: Plant Science Project-Seminar II (A)**

Coordinator: **Profs. Daniels and Atlin**

*Prerequisite:* PS449

The continuation and conclusion of the subject selected in PS449. This consists of both a written and oral presentation of the project.

Fall semester — 2 lecs per week.

**PS475: Plant Biotechnology (A)**

Instructor: **Prof. Nowak**

*This course has a limited enrolment.*

This course covers the culture of plant cells, tissues and organs, somatic embryogenesis and organogenesis, screening for pathogen and stress tolerance, and the application of these techniques in plant propagation, virus eradication, and plant breeding. Production of secondary metabolites, germplasm preservation, and genetic manipulations are considered. Completion of an assigned project is a part of this course.

Winter semester — 2 lecs and 4 labs per week. Offered in alternate years; not offered in 1995–96.

Text — Lindsay and Jones, *Plant Biotechnology in Agriculture*; Dixon, *Plant Cell Culture, A Practical Approach*.



## **Graduate Courses**

### **Required Regular Courses**

#### **AG570: Communication Skills & Graduate Seminar**

Instructor: **Prof. Haley**

Through practical assignment students will be able to test and develop their communication skills. Topics will include journal papers, grant applications, posters, seminars, lectures and interviews. This course is required for students enrolled in the M.Sc. in Agriculture Program.

Fall and Winter semesters— 1 lec per week.

#### **AG571: Module Course**

Instructors: **Staff, TBA**

Each module consists of one month of lectures (2–3 hours per week) dealing with a topic in the lecturer's area of expertise. Research interests of incoming students are taken into account each year when module topics are solicited. Depending on the background of the student selecting the module, the work will be at an introductory graduate level. However, students should not apply to take a module unless they have at least a second year undergraduate background in related material. A formal evaluation is made at the end of each module. This course normally consists of three modules. All graduate students are required to complete this course, and are encouraged to do so in their first year of study.

Fall semester — 2 or 3 lecs per week.

#### **AG900: Graduate Thesis**

Students register for this course when they are engaged in research work for credit towards the M.Sc. in Agriculture degree.

## Recommended Regular Courses

### **AG572: Applied Statistics & Experimental Design for Agriculture**

Instructor: **D. Montgomery**

*Prerequisites:* MP200 and MP320, or two equivalent one-semester courses in applied statistics.

This course is designed to provide: i) practical skills in statistical methods and experimental designs, ii) an appreciation of situations when more complex models and methods are required, and iii) the ability to communicate experimental problems and results clearly to colleagues and statistical consultants. Students will be expected to successfully complete practical exercises involving real experimental problems and data sets. Students will also be expected to acquire proficiency in at least one advanced statistical software package. This course is recommended for students enrolled in the M.Sc. In Agriculture Program.

Winter semester — 3 lecs per week.

## Other Regular Courses

### **AG535: Animal Research Methods**

Instructors: **Staff, TBA**

This course is designed for students who are, or expect to be, working in Animal Science, or who have an interest in the methodology and ethics of animal research. The course will include consideration of some of the common or promising laboratory and field methods associated with domestic animal research, ethics of animal research, the analysis and interpretation and reporting of results. Students will be expected to participate in exercises, to contribute to discussions, and to present reviews on various aspects.

Fall semester: To be arranged with the Instructor.

### **AG536: Protein Nutrition**

Instructor: **Prof. Anderson**

A study of the sources, availability, and metabolism of protein and amino acids for the domestic animal. Subjects addressed include discussion of sources of protein, factors affecting digestibility of protein, digestion and absorption of protein and nitrogen, urea recycling, individual amino acid metabolism, excretion of nitrogenous wastes in birds and mammals, and protein and amino acid requirements of animals.

Winter semester: To be arranged with the Instructor. Offered in alternate years; not offered in 1995–96.

**AG538: Quantitative Genetics**

Instructor: **Prof. Patterson**

An introduction to quantitative genetics theory and to statistical techniques used in domestic animal improvement. Computing and statistical techniques will be demonstrated, presented, and relevant literature will be surveyed. Reference will be made throughout to performance recording programs used in Canada and throughout the world.

Winter semester: To be arranged with the Instructor.

**AG539: Molecular Genetic Analysis of Populations**

Instructor: **Prof. Farid**

This course is designed to give graduate students some understanding of the theoretical aspects of population and molecular genetics. Applications of DNA fingerprinting in population genetic studies will be discussed. Students will acquire hands-on experience in DNA fingerprinting. Estimation of band frequency and band sharing, and their relationships with such population parameters as gene frequency, inbreeding, and genetic distance will be covered.

Fall semester: To be arranged with the Instructor.

**AG552: Plant Breeding Methods**

Instructors: **Profs. Atlin and Papadopoulos**

Genetic and statistical principles underlying modern plant breeding methods are introduced. Those principles will be reinforced through the use of computer models. Cultivar development techniques for self- and cross-pollinated species are examined in detail. Applications of tissue culture, genetic engineering, and marker-facilitated selection are discussed. This course is open to students who have had introductory courses in genetics, plant breeding, statistics, and molecular biology.

Fall semester: To be arranged with the Instructor.

**AG553: Nitrogen in Crop Production**

Instructor: **Prof. Martin**

Students will study the transformations of N in air, soil, water, and plants and consider crop requirements for N. Topics include the chemistry of N, the N cycle, N transformations in soil, N metabolism in plants, N transport in plants, N-fixation, N losses in agricultural systems, and an evaluation of N fertilizer in these systems.

Fall semester: To be arranged with the Instructor. Offered in alternate years; not offered in 1995–96.



**AG556: Advanced Crop Physiology**

Instructor: **Prof. Caldwell**

Physiological processes relevant to crop plant development and production of harvestable yield will be examined.

Winter semester: To be arranged with the Instructor. Offered in alternate years; not offered in 1995–96.

**Special Topics Courses**

**AG521: Special Topics in Environmental Microbiology**

Instructor: **Prof. Stratton**

This course will allow students to study a particular topic in the field of environmental microbiology in more depth than would be practical in a general course. The student will choose a topic in consultation with the instructor. An in-depth literature search will be required and the material gathered will be discussed in weekly tutorial sessions. Laboratory work will be conducted when required and if appropriate to the topic chosen. Topics for study can be of either a theoretical or applied nature, with the needs of the student being a primary factor in finalizing the topic.

Fall semester: To be arranged with the Instructor.

**AG522: Special Topics in Weed Science**

Instructor: **Prof. Doohan**

Topics might include: evolution of weeds, impact of weeds on human history, weed ecology and physiology, crop/weed interactions, herbicide chemistry, physiological and biochemical behaviour of herbicides in plants, environmental fate of herbicides, myco-herbicides, biorationals. Two term projects and a research critique will be required.

Winter semester: To be arranged with the Instructor.

**AG524: Special Topics in Environmental Impact**

Instructor: **Prof. Stratton**

This course will allow students to study a particular topic in the field of environmental impact or environmental toxicology in more depth than would be practical in a general course. The student will choose a topic for study in consultation with the instructor. An in-depth literature search will be required and the material gathered will be discussed in weekly tutorial sessions. Laboratory work will be conducted when required and if appropriate to the topic chosen. Topics for study should be related to the student's area of research or interests.

Winter semester: To be arranged with the Instructor.

**AG526: Special Topics in Plant Pathology**

Instructors: **Profs. Gray and Singh**

This course will be custom-designed to meet the specific needs of graduate students specializing in the area of plant pathology who need further specific knowledge and/or skills.

Fall or Winter semester: To be arranged with the Instructor.

**AG531: Special Topics in Applied Ethology**

Instructor: **Prof. Tennessen**

Course content will vary. Topics covered will be chosen so as to meet the requirements of individual graduate students. Aspects could include the assessment of farm animal welfare, foraging behaviour, environmental enrichment, social dynamics of livestock, early rearing environment and the effect on later behaviour.

Fall semester: To be arranged with the Instructor.

**AG532: Special Topics in Animal Nutrition**

Instructors: **Profs. Anderson and Fredeen and other faculty as needed**

The course is designed to provide an opportunity to study specific aspects of animal nutrition. Aspects could include study of a particular nutrient, a process in nutrition, a nutritional state, or nutrient metabolism of a specific species with focus on the research method. The student is advised to consult with their supervisor to determine the specific scope of the topic to be studied.

Fall or Winter semester: To be arranged with the Instructor.

**AG534: Special Topics in Animal Physiology**

Instructor: **TBA**

This course is for students with a major interest in animal physiology. The course will consist of discussions, term papers, and presentations. Students will be expected to nominate topics for consideration and to prepare major reviews and class presentations of selected topics.

Fall semester: To be arranged with the Instructor.

**AG537: Special Topics in Animal Breeding and Genetics**

Instructor: **Prof. Crober**

Provides students with an opportunity to pursue more detailed studies in Animal Breeding/Genetics. Topics will be decided on by the student in consultation with faculty members for the purpose of meeting the student's specific needs as defined by the thesis research. Delivery will be a combination of directed reading and tutorial discussions.

Fall or Winter semester: To be arranged with the Instructor.

**AG541: Special Topics in Soil Fertility**

Instructor: **Prof. Warman**

The course is designed to provide an opportunity to study specific aspects of soil fertility. Topics may include the influence of soil biological, chemical, and physical properties and processes on nutrient absorption and plant growth, with emphasis on essential plant nutrients in the soil and methods for evaluation, as well as the use of inorganic and organic amendments.

Winter semester: To be arranged with the Instructor.

**AG543: Special Topics in Environmental Analysis**

Instructor: **Prof. Hoyle**

Students may apply to undertake either a specially designed course in environmental analysis, or to undertake additional work further to Organic Environmental Analysis. This may be facilitated with written consent from the instructor who then assumes personal responsibility for supervising the work.

Fall or Winter semester: To be arranged with the Instructor.

**AG551: Special Topics in Plant Breeding**

Instructors: **Profs. Atlin and Papadopoulos**

This course will be designed to meet the specific needs of graduate students specializing in the area of Plant Breeding who need further specific knowledge and/or skills.

Fall or Winter semester: To be arranged with the Instructor.



**AG554: Special Topics in Crop Physiology**

Instructors: **Profs. Caldwell, Asiedu, Goodyear, and Martin**

This course will be designed to meet the specific needs of graduate students specializing in the area of Crop Physiology who need further specific knowledge and/or skills.

Fall or Winter semester: To be arranged with the Instructor. Offered in alternate years; offered in 1995-

**AG557: Special Topics in Agricultural Biotechnology**

Instructor: **Prof. Nowak**

This course will be designed to meet the specific needs of graduate students specializing in the area of Agricultural Biotechnology who need further specific knowledge and/or skills.

Fall or winter semester: To be arranged with the Instructor.

**AG561: Special Topics in Animal Product Technology**

Instructor: **Prof. Firth**

This course will review areas important in the technology of foods derived from animals (meat, fish, eggs, milk). Such areas could include chemistry (lipid oxidation, Maillard reactions), physics (changes caused by freezing, sol-gel conversion, colour) and microbiology (spoilage, pathogenic organisms, modified-atmosphere packaging, HACCP). Each student will be expected to present a review of a particular topic.

Fall semester: To be arranged with the Instructor.

## **Cross-Referenced Courses**

**AG525: Soil Microbiology** *cross-referenced as B400*

Instructor: **Prof. Stratton**

This course is designed to provide an intensive study of the microbiology of soils and will emphasize nutrient cycling and biodegradation. Topics covered include the relationships between the abiotic and biotic components of soils, the microbial biochemistry of the carbon, nitrogen, sulphur, phosphorus, and selected micronutrient cycles, heavy metal cycling, and the microbial degradation of industrial wastes and pesticides. The laboratory classes will concentrate on techniques to monitor the microbial biomass in soil and the microbial components of nutrient cycles. These include new advances in bacterial taxonomy and identification and the use of gas chromatography and high performance liquid chromatography in quantitating nutrient cycling. In addition to a major term paper, a comprehensive laboratory report on the entire term's lab work, and a single take-home examination, graduate students will be required to:

- (a) Modify the term paper into a critical review of some aspect of soil microbiology (chosen in consultation with the instructor); the review must be current and in depth; it must be written in manuscript format and will be graded accordingly.
- (b) Perform additional laboratory exercises not assigned to undergraduate students; use more replicates; perform a full statistical analysis of data; provide a report in manuscript format.
- (c) give a seminar to the class on their term paper topic.

Fall semester: To be arranged with the Instructor.

**AG544: Organic Environmental Analysis** *cross-referenced as CS420*

Instructor: **Prof. Hoyle**

*This course has limited enrolment.*

The course will involve the study of the analytical chemical techniques used in the analysis of environmental samples obtained from the atmosphere, hydrosphere, and lithosphere. Included in this study will be the sampling methods used for air, water, soil, food and wastes, and modelling of environmental contamination. In addition, government regulations, hazard assessment and public awareness of these issues will be discussed. In addition to successfully completing examinations graduate students will be required to perform the following tasks:

- (a) To write a major paper on an important topical issue.
- (b) To present that paper as a seminar before Departmental faculty, staff & students.
- (c) To write a research proposal prior to starting the laboratory project.

Fall semester — To be arranged with the Instructor. Offered in alternate years; not offered in 1995–96.

**AG545: Environmental Soil Chemistry** *cross-referenced as CS440*

Instructor: **Prof. Warman**

The course is designed to provide an opportunity to study specific aspects of environmental soil chemistry. Topics may include the chemical composition of soils with special attention to soil biochemistry and soil organic matter with an emphasis on organic matter-clay interactions, soil organic N, P and S, and soil enzymology. Graduate students will be expected to participate in lecture/discussion sessions and complete required reading assignments. In addition, graduate students will be required to complete research papers and present their findings at in-class seminars.

Winter semester — To be arranged with the Instructor. Offered in alternate years; offered in 1995–96.



**AG558: Plant Biotechnology** *cross-referenced as PS475*

Instructor: **Prof. Nowak**

*This course has limited enrolment.*

This course covers the culture of plant cells, tissues and organs, somatic embryogenesis and organogenesis, screening for pathogen and stress tolerance, and the application of these techniques in plant propagation, virus eradication, and plant breeding. Production of secondary metabolites, germplasm preservation, and genetic manipulations are considered. Graduate students give three seminars and prepare one laboratory activity. A written report on the assigned research project in the form of a short communication for submission to *Plant Cell Reports* is part of the requirement.

Winter semester — 2 lecs and 4 labs per week. Offered in alternate years; not offered in 1995–96.  
Text-Lindsay and Jones, *Plant Biotechnology in Agriculture*; Dixon, *Plant Cell Culture, A Practical Approach*.

**AG562: Ruminant Digestive Physiology & Metabolism** *cross-referenced as AS475*

Instructors: **Profs. Fredeen and Lirette**

*Prerequisites:* AS300, AS305, CS360

This course is designed to provide an intensive study of food intake and digestion, and nutrient absorption and metabolism, in the ruminant animal. The course details current knowledge and focuses on aspects of future research interest. Students are expected to contribute to discussions and present reviews to the class on various aspects of the subject.

Fall semester — 3 lecs and 2 labs per week. Offered in alternate years; not offered in 1995–96.



## **Vocational Courses**

The Nova Scotia Agricultural College offers pre-employment and upgrading courses for several specific farm and farm-related careers. These may be of varying lengths and offered at different times of the year depending upon the topic(s).

Continuing Education Programs include evening courses, home study courses and professional upgrading courses. In addition, Independent Study courses are available, and other courses are currently being developed.

The following courses have been offered in the past and are presented to give an idea of the range of programming offered.

- Accounting and Taxation (Farm)
- Advanced WordPerfect 5.1
- Applying AutoCAD
- Basic Flower Arranging for the Home
- Bedford Accounting
- Dairy Herd Operation
- dBase IV
- Developing a Business Strategy
- Dried Floral Design Workshop
- Effective Business Communications
- Farm Skills
- Farrier (Basic)
- Floral Design
- Garden Center Merchandising
- Herbicide Use in Integrated Weed Management
- Improving Your Effectiveness
- Increasing Your Effectiveness as a Board Member
- Installation of Modular Pavers
- Introduction to Computer Aided Drafting
- Introduction to Microcomputers
- Introduction to WordPerfect
- Ironwork
- Keeping Pests and Weeds Out of the Lawn and Garden
- Landscape Business Management
- Landscape Construction
- Landscape Design

---

*Nova Scotia Agricultural College Calendar 1995-1996*

- Landscape Plants: Planting and Maintenance
- Lotus 1-2-3
- Lotus, Database and Graphics
- Meat Cutting
- Meat Department Management
- Meat Merchandising
- Mink Production
- On-Farm Computers
- Opportunities for Small-Scale Farming
- Pesticide Safety for Farmers
- Pesticide Safety for Landscapers
- Pesticide Vendors' Course
- Pesticides—Crop Protection, Application and Safety
- Pet Nutrition
- Planning the Home Landscape
- Pond Culture of Trout
- Poultry Production
- Race Horse Shoeing
- Residential Landscape Design and Construction
- Small Poultry Flock Management
- Swine Herd Operation
- Tree Fruit Production and Marketing
- Turf Production
- Vegetable Production
- Weed Science Principles
- Welding (Basic Farm)

For information on courses offered and costs, contact

Vocational and Continuing Education  
Nova Scotia Agricultural College  
P. O. Box 550  
Truro, Nova Scotia  
B2N 5E3  
Telephone 893-6666.

## **Scholarships, Bursaries, and Prizes**

### **Definition of Terms**

Award	An award is a general term used to mean any presentation made to a student.
Governor-General's Medal	The Governor-General's Medals are awarded to the student with the highest academic standing in each of the major programs, Masters, Degree and Technical.
Scholarship	A scholarship is a monetary award to a student based primarily on academic performance, although other considerations may be considered based on the donor's requirements.
Bursary	A bursary is a monetary award to a student where the primary criterion is not academic performance.
Prize/Gift	A prize or gift is an award given to a student based on the selection of the donor.
<b>Note:</b>	In the descriptions of the various scholarships, bursaries, and prizes that follow where the selection criteria are not specified, the guidelines above apply.

### **Entrance Scholarships and Bursaries**

The following scholarships and bursaries are available to students entering a first year of study at the Nova Scotia Agricultural College.

#### **Atlantic Shopping Centres Scholarship**

The Atlantic Shopping Centres \$1000 entrance scholarship is awarded to students entering their first year of study in a degree program. Selection is based on academic performance and financial need. Applications must be submitted to the NSAC Awards Office not later than September 20.

#### **Canada Scholarships in Science and Engineering**

The Government of Canada, through Industry Canada, grants 2500 **Canada Scholarships in**



**Science and Engineering** to first-year students entering undergraduate studies in selected natural sciences, engineering and related disciplines. Worth \$2500 annually and renewable for up to three times, the scholarships are worth up to \$10,000 over four years. Canada Scholarships are awarded about equally between men and women. Furthermore, outstanding Canada Scholars in their third and fourth years of study in certain disciplines may also be recommended by the college to receive an additional award sponsored by the corporate sector. Applications must be submitted to the NSAC Awards Office not later than June 20.

### **Canada Scholarships in Technology**

The Government of Canada, through Industry Canada, grants 1600 **Canada Scholarships in Technology** to first-year students entering technical studies in selected Technician and Technology disciplines. Worth \$2500 annually and renewable for up to two times, the scholarships are worth up to \$7500 over three years. Canada Scholarships in Technology are allocated about equally between men and women. Applications must be submitted to the NSAC Awards Office not later than June 20.

The following programs at NSAC are eligible for Canada Scholarships in Technology:

- Agricultural Engineering Technician
- Agricultural Technology
- Animal Science Technician
- Biology Technology
- Chemistry Laboratory Technology
- Farming Technology
- Food Quality Technology
- Plant Science Technician

### **Chicken Producers Association of Nova Scotia Bursary**

The Chicken Producers Association of Nova Scotia \$1000 bursary is awarded to a Nova Scotia student at NSAC who shows a demonstrated interest in pursuing the study of poultry. Preference will be given to applicants with a farming background. Students in all years of study are eligible. A student may not receive this scholarship more than once. A letter of application must be submitted not later than September 20 to:

Secretary  
Chicken Producers Association of Nova Scotia  
Agricultural Centre  
Kentville, Nova Scotia B4N 1J5

### **Co-op Atlantic Bursaries**

Three \$500 Co-op Atlantic bursaries are awarded to students entering the technical program. Selection is based on financial need, potential for community leadership and/or co-operative endeavour and the recommendation of a local co-operative or district Federation of Agriculture. These bursaries are renewable for a second year when the recipient forwards to the donor first-year marks and confirmation of enrolment. Applications must be submitted to the NSAC Awards Office not later than September 20.

### **Hank DeBoer Memorial Scholarship**

The Hank DeBoer Memorial Scholarship of \$500 is awarded to a Nova Scotia student who enters a degree or technical program at NSAC and who receives no other scholarship with a higher value. The selection of the recipient will be based on academic performance. No application is required.

### **Kings County Federation of Agriculture Bursary**

The \$500 Kings County Federation of Agriculture Bursary is awarded to a resident of Kings County, N.S., enrolled full-time at NSAC. Selection criteria include financial need, academic performance, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the donor. Applications are available from and must be received by August 1 at the following address:

Kings County Federation of Agriculture  
P.O. Box 338  
Canning, Nova Scotia B0P 1H0

### **Newfoundland and Labrador Federation of Agriculture Scholarships**

To encourage local students to pursue careers in the agri-products industry, the Newfoundland and Labrador Federation of Agriculture awards two \$500 scholarships to Newfoundland students (preferably one from the East Coast and one from the West Coast) entering studies at NSAC. Selection criteria include academic performance and financial need. Applications must be submitted to the NSAC Awards Office not later than September 20.

### **Newfoundland Provincial Scholarships**

The Newfoundland government, through its Department of Education, awards three scholarships of \$1000 each to Newfoundland students entering the first year of a degree program at NSAC. Selection will be based on academic performance. No application is required.



**Newfoundland Milk Marketing Board Scholarships**

Two \$500 Newfoundland Milk Marketing Board Scholarships are awarded to first-year Newfoundland students (one technical and one degree). Selection will be based on academic performance. No application is required.

**Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Degree Programs**

The Nova Scotia Department of Agriculture and Marketing awards 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:

**\$2000**

Scholarships of \$2000 each are awarded to the three students with the highest averages in the subjects required for admission. These scholarships are renewable 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, \$2000 will be offered 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.

**\$1500**

Scholarships of \$1500 each are awarded to all other students with averages of 80% or higher in the subjects required for admission. These scholarships are renewable for those students who maintain scholarship level at NSAC. For those who maintain an 80% average with no failed subjects, \$1500 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.

**Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Technical Programs**

The Nova Scotia Department of Agriculture and Marketing awards entrance scholarships to residents of Nova Scotia accepted for the Technical Programs with averages of 80% or higher in the subjects required for admission. These scholarships are at two levels:

**\$1000**

Scholarships of \$1000 each are awarded to the three students with the highest averages in the subjects required for admission. These scholarships are renewable at NSAC for the normal duration of the program. For renewal students must have maintained an average of at least 80% with no failed subjects in the previous year.



**\$500**

Scholarships of \$500 each are awarded to all other students with averages of 80% or higher in the subjects required for admission. These scholarships are renewable for those students who maintain scholarship level for the normal duration of their program. For renewal students must have maintained an average of at least 80% with no failed subjects in the previous year.

**Nova Scotia Agricultural College Alumni Association Scholarships**

The NSAC Alumni Association awards two \$1000 scholarships to first-year students. Selection will be based on academic performance. No application is required.

**Nova Scotia Institute of Agrologists Scholarship**

The \$1000 NSIA Scholarship is awarded to a Nova Scotia student entering a degree program at the NSAC. In awarding the scholarship, the selection committee will take into consideration academic performance, participation in school and community activities, degree of interest in agrology and pursuing a career in the agri-food industry, and financial need. Applications are available from and must be received by August 1 at the following address:

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

**Prince Edward Island Institute of Agrologists Scholarship**

The \$500 PEIIA Scholarship is awarded to a P.E.I. student entering the B.Sc. (Agr.) program. Selection criteria include academic performance, school and community involvement and financial need. Applications must be submitted to the NSAC Awards Office not later than September 20.

**F.W. Walsh Memorial Scholarship**

In memory of the outstanding agriculturalist F. Waldo Walsh, this \$800 scholarship is awarded to a student who is admitted to a degree program at NSAC. Selection is based primarily on academic performance. Financial need and participation in school and community affairs will also be considered. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Woodside Memorial Scholarships**

In memory of Harold and Mary Woodside, formerly of Alderbrook Farm, Margate, P.E.I., three \$1000 scholarships are awarded to first-year P.E.I. students. Selection criteria include academic

performance, financial need, and participation in sports, school, and community activities. Application forms are available from guidance counsellors at P.E.I. high schools and must be submitted not later than August 15.

## **Continuation Scholarships and Bursaries**

The following scholarships and bursaries are available to students returning to studies beyond the first year of the various programs at the Nova Scotia Agricultural College.

### **For Degree Students**

#### **Ralph H. Armstrong Memorial Bursary**

The family and friends of the late Ralph Hallett Armstrong award a bursary of \$500 to a student who has completed a first year of study at NSAC. Former or current 4-H club members from Kings or Annapolis Counties in Nova Scotia are eligible to apply. Selection is based on financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

#### **Atlantic Farm Mechanization Show Scholarship**

The Atlantic Farm Mechanization Show awards a \$1000 scholarship to a student from the Atlantic Provinces who has completed at least one year of study at NSAC. Students in Ag. Engineering, Mechanization or Farm Equipment are eligible. The awarding of the scholarship is based on academic performance and the demonstrated potential for a career in the area of mechanization of agriculture. No application is required.

#### **Atlantic Fertilizer Institute Scholarship**

The Atlantic Fertilizer Institute awards a \$1000 scholarship to a student from the Atlantic Provinces who is entering the second year of the B.Sc. (Agr.) program. Preference will be given to students with farming interests studying in an option relating to the production of crops. Selection criteria include academic performance, participation in student life, contribution to the college community, and financial need. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Atlantic Land Improvement Contractors Association Bursary**

The Atlantic Land Improvement Contractors Association Bursary of \$500 is available to degree Agricultural Engineering students with a demonstrated ability and interest in soil, water, and land improvement. No application is required.

**Atlantic Provinces Hatchery Federation Bursary**

The Atlantic Provinces Hatchery Federation awards a bursary of \$300 to a third- or fourth-year B.Sc. (Agr.) student from the Atlantic Provinces who is enrolled in subjects that make poultry a major area of study. A letter of application must be received by September 20 at the following address:

Mr. George Smith  
Supervisor of Poultry  
Nova Scotia Dept. of Agriculture and Marketing  
Box 550  
Truro, Nova Scotia B2N 5E3

**A.B. Banks Memorial Scholarship**

The \$250 A.B. Banks Memorial Scholarship is awarded to the B.Sc. (Agr.) student with the highest cumulative average at the completion of the first year and who enters the second year of the Animal Science option. No application is required.

**Beaver Foods Limited Scholarships**

Beaver Foods Limited awards four \$500 scholarships to outstanding students with high academic performance who, for one reason or another, have not qualified for other significant awards. No application is required.

**Blueberry Producers Association of Nova Scotia Scholarship**

The Blueberry Producers Association of Nova Scotia awards a \$500 scholarship to a Plant Science student entering the third or fourth year of the B.Sc. (Agr.) program. Selection will be based on academic performance and financial need. Preference will be given to someone with a specialization in small fruits. Applications must be submitted to the NSAC Awards Office not later than September 20.



**Bravo 500 Pest Management Scholarship**

ISK BIOTECH INC. awards a \$1250 scholarship to a student entering the third or fourth year of the Pest Management option at the NSAC. Selection criteria include academic performance, interest in the Maritime potato industry, and potato farm experience or background. Applications must be submitted to the NSAC Awards Office not later than September 20.

**David W. Brown Memorial Bursary**

The ACA Co-operative Limited awards two \$500 bursaries to students entering a second year of study. Selection criteria include financial need, academic performance, and interest in farming and in the poultry industry in particular. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Canadian Feed Industry Association (Atlantic Division) Scholarship**

The Atlantic Division of the Canadian Feed Industry Association awards a \$600 scholarship to a student who is entering the third year of the B.Sc. (Agr.) program. Selection criteria include academic performance and leadership in student and community affairs. This scholarship is not available to students receiving other scholarships of higher value. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Gerard Chiasson Memorial Bursary**

The Inverness County Federation of Agriculture awards two \$250 bursaries to Cape Breton students who have completed at least one year of study at the NSAC. The bursaries are awarded in memory of Gerard Chiasson, a past president of the Nova Scotia Federation of Agriculture who was also active in other local farm and community organizations. Selection criteria include financial need, involvement in community activities, and leadership experience. In the event that more than two students possess otherwise equal qualifications, preference will be given to students from Inverness County. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Chicken Producers Association of Nova Scotia Bursary**

The Chicken Producers Association of Nova Scotia \$1000 bursary is awarded to a Nova Scotia student at NSAC who shows a demonstrated interest in pursuing the study of poultry. Preference will be given to applicants with a farming background. Students in all years of study are eligible.

A student may not receive this scholarship more than once. A letter of application must be submitted not later than September 20 to:

Secretary  
Chicken Producers Association of Nova Scotia  
Agricultural Centre  
Kentville, Nova Scotia B4N 1J5

**Donald E. Clark Memorial Scholarship**

In memory of Donald E. Clark, former Professor and Head of the Agricultural Engineering Department, one or more scholarships (with total value of \$600) are awarded to final-year students in the Agricultural Engineering Department. Selection criteria include academic performance, interest, and aptitude in the engineering field. No application is required.

**Colonel Charles Coll Memorial Scholarship**

In memory of Colonel Charles H. Coll, a \$500 scholarship is awarded to a student from the Maritime Provinces in the final year of an Animal Science option. Selection criteria include academic performance, involvement and interest in poultry, and achievement and contribution to 4-H. No application is required.

**Co-op Atlantic Scholarship**

Co-op Atlantic awards a \$1000 scholarship to a student at NSAC who is from the Atlantic Provinces and is entering the third year of the B.Sc. (Agr.) program. Selection criteria include academic performance, financial need, and knowledge and appreciation of co-operatives. The award may be tenable for two years. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Dorothy Creelman Cox Scholarship**

A \$200 scholarship is awarded to a female student entering the second year of the B.Sc. (Agr.) program in the Plant Science option. Selection criteria include academic performance and contribution to the college community. No application is required.

**Dr. Kenneth Cox Scholarship**

In memory of Dr. Kenneth Cox, former Principal, this scholarship is awarded to a student entering the final year of the B.Sc. (Agr.) program. No application is required.



**Wilfred Cyr Memorial Bursary**

The New Brunswick Sheep Breeders Association, in memory of the late Wilfred Cyr, awards a \$200 bursary to a student from New Brunswick who has completed the first year of study at NSAC. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Eastern Canada Soil and Water Conservation Centre Bursary**

The Eastern Canada Soil and Water Conservation Centre awards a \$1000 bursary to the team of students submitting the best project proposal for their end of degree final project. The bursary is intended to recognize and support multi-disciplinary study in integrated soil management. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Ernest L. Eaton Memorial Scholarships**

Two \$500 scholarships, one for a male and one for a female, are awarded to students entering the third year of the B.Sc. (Agr.) program. Selection is based on the student's averages in the second year of their program. No application is required.

**Farm Credit Corporation Scholarship**

The Atlantic Region of the Farm Credit Corporation awards a \$1000 scholarship to a Canadian student entering the fourth or final year of the B.Sc. (Agr.) program in the Agricultural Economics option. Selection criteria include academic performance, interest and competence in farm management and in the subjects associated with the economics of the farm business, interest and involvement in college and home community as demonstrated by participation in organizations and affairs, farm experience, and financial need. No application is required.

**Farm Focus Bursary**

The Farm Focus Bursary of \$200 is awarded to a student entering the second year of study. Selection is based on financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Hillbreeze Acres Scholarship**

A \$500 scholarship is awarded to a student who has completed at least one year of the B.Sc. (Agr.) program with a good academic record and has participated in athletics at the college. Applications must be submitted to the NSAC Awards Office not later than September 20.



**Kings County Federation of Agriculture Bursary**

The \$500 Kings County Federation of Agriculture Bursary is awarded to a resident of Kings County, N.S., enrolled full-time at NSAC. Selection criteria include financial need, academic performance, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the donor. Applications are available from and must be received by August 1 at the following address:

Kings County Federation of Agriculture  
P.O. Box 338  
Canning, Nova Scotia B0P 1H0

**Lunenburg County Federation of Agriculture Scholarship**

The Lunenburg County Federation of Agriculture Scholarship of \$300 is awarded to a student from Lunenburg or Queens Counties in Nova Scotia entering a second year of study at NSAC. Selection criteria include academic performance, farm or agricultural background or experience, and plans to pursue a career in the agricultural industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**A.W. Mackenzie Memorial Scholarship**

A \$150 scholarship is awarded to a student entering the second year of the degree program. Selection criteria include academic performance, financial need, and participation in 4-H Club activities. A letter of application detailing 4-H experience must accompany your application. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Angus and Tena MacLellan Memorial Scholarship**

This \$1000 scholarship is awarded to a student entering the third or fourth year of a degree program. Angus and Tena MacLellan farmed in Cloverville, Antigonish County, Nova Scotia. No application is required.

**McRorie Scholarship**

In memory of Douglas McRorie, P.Ag., FAIC, former President of AIC and Vice-President (Agricultural Services) of the Royal Bank of Canada, a \$500 scholarship is awarded to a student who has completed the second or third year of the B.Sc. (Agr.) program. Students in any area of specialization are eligible, but applicants must demonstrate a knowledge of and interest in financial management through their studies, employment, career plans, and/or extracurricular activities. Applications must be submitted to the NSAC Awards Office not later than June 1.

**A.C. Neish Memorial Trust Scholarship**

The A.C. Neish Memorial Trust awards a \$1400 scholarship to an NSAC student who completes the third year of the B.Sc. (Agr.) program. Selection criteria include high academic performance and qualities of leadership as indicated by participation and achievement in both academic and non-academic activities. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Newfoundland Egg Marketing Board Scholarship**

The Newfoundland Egg Marketing Board Scholarship of \$1000 is awarded to a Newfoundland student entering the third or fourth year of the B.Sc. (Agr.) program. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Degree Programs**

The Nova Scotia Department of Agriculture and Marketing awards scholarships to all Nova Scotia students who are enrolled in the second, third, or fourth year of the degree program with averages in the work of the previous year at NSAC of 75% or higher.

\$2000 is awarded to those students receiving \$2000 awards on entrance who have maintained an average of 80% or higher in the previous year with no failed subjects.

\$1500 is awarded to all other students with averages in the work of the previous year of 80% or higher and with no failed subjects.

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

**Nova Scotia Federation of Agriculture Bursaries**

The Nova Scotia Federation of Agriculture awards two \$300 bursaries to second-year Nova Scotia students (one technical and one degree). Selection criteria include financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Nova Scotia Milk Producers Scholarship**

The Nova Scotia Milk Producers Association awards a \$1000 scholarship to a Nova Scotia student entering the third or fourth year of the B.Sc. (Agr.) program. Selection criteria include academic



performance and interests and project work in the dairy industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**G. E. O'Brien Memorial Bursary**

In memory of George Earle O'Brien, a 1911 NSAC graduate, a \$750 bursary is awarded to a degree student who has demonstrated a particular interest in and aptitude for sheep and wool production and marketing. No application is required.

**Ira L. Rhodenizer Memorial Scholarship**

In memory of Ira L. Rhodenizer, the Nova Scotia Federation of Agriculture awards a \$300 scholarship to a second-year Nova Scotia student. Selection criteria include academic performance, involvement in student affairs, and participation in the 4-H program. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Robin Hood Multifoods Inc. Bursary**

Robin Hood Multifoods Inc., awards a \$1200 bursary to an Atlantic student entering the second year of a Business or Economics or Animal Science program. The scholarship is to encourage students to consider a career in sales and technical service in private industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Rhonda Rae Rumbolt Memorial Scholarship**

In memory of Rhonda Rae Rumbolt, a \$2000 scholarship is awarded to a fourth-year B.Sc. (Agr.) student. Selection criteria include academic performance and involvement in the college community as displayed by participation in extracurricular activities. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Shur-Gain Division/Maple Leaf Foods, Inc. Scholarship**

Shur-Gain Division/Maple Leaf Foods, Inc. awards a \$1000 scholarship to a fourth-year B.Sc. (Agr.) student in the Animal Science option. Selection criteria include academic performance, leadership qualities, and participation in student and community affairs. Applications must be submitted to the NSAC Awards Office not later than February 1.

**Bruce Trenholm/Atlantic '86 Scholarship**

A \$500 prize is awarded to an Atlantic student entering the final year of any program with a



Holstein farm or 4-H (Holstein calf project) background. Selection criteria include academic performance and career goals. Applications must be submitted to the NSAC Awards office not later than September 20.

### **Vice-Principal's Scholarship**

This scholarship is awarded to a fourth-year B.Sc. (Agr.) student. No application is required.

### **Women's Institutes of Nova Scotia Scholarship**

The Women's Institutes of Nova Scotia awards a \$500 scholarship to a student entering the third year of the B.Sc. (Agr.) program. Selection criteria include academic performance, leadership and participation in student and community affairs, career plans, and financial need. Applications are available from and must be received by May 15 at the following address:

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

### **For Technical Students**

#### **Ralph H. Armstrong Memorial Bursary**

The family and friends of the late Ralph Hallett Armstrong award a bursary of \$500 to a student who has completed a first year of study at NSAC. Former or current 4-H club members from Kings or Annapolis Counties in Nova Scotia are eligible to apply. Selection is based on financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

#### **Atlantic Farm Mechanization Show Scholarship**

The Atlantic Farm Mechanization Show awards a \$1000 scholarship to a student from the Atlantic Provinces who has completed at least one year of study at NSAC. Students in Ag. Engineering, Mechanization or Farm Equipment are eligible. The awarding of the scholarship is based on academic performance and the demonstrated potential for a career in the area of mechanization of agriculture. No application is required.

**Atlantic Fertilizer Institute Bursary**

The Atlantic Fertilizer Institute awards a \$500 bursary to a second-year student in the technician or farming technology program. Selection criteria include farm interests, leadership qualities within the college community, and academic performance. Applications should be submitted to the NSAC Awards Office not later than September 20.

**Atlantic Provinces Hatchery Federation Bursary**

The Atlantic Provinces Hatchery Federation awards a \$200 bursary 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 by September 20 to:

Mr. George Smith  
Supervisor of Poultry  
Nova Scotia Dept. of Agriculture and Marketing  
Box 550  
Truro, Nova Scotia B2N 5E3

**Beaver Foods Limited Scholarships**

Beaver Foods Limited awards four \$500 scholarships to outstanding students with high academic performance who, for one reason or another, have not qualified for other significant awards. No application is required.

**Bravo 500 Technology Bursary**

ISK BIOTECH INC. awards a \$500 bursary to a student entering the second year of a technology program at NSAC. Selection criteria include academic performance, financial need, and interest in the agricultural industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**David W. Brown Memorial Bursary**

The ACA Co-operative Limited awards two \$500 bursaries to students entering a second year of study. Selection criteria include financial need, academic performance, and interest in farming and in the poultry industry in particular. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Gerard Chiasson Memorial Bursary**

The Inverness County Federation of Agriculture awards two \$250 bursaries to Cape Breton students who have completed at least one year of study at the NSAC. The bursaries are awarded in memory of Gerard Chiasson, a past president of the Nova Scotia Federation of Agriculture who was also active in other local farm and community organizations. Selection criteria include financial need, involvement in community activities, and leadership experience. In the event that more than two students possess otherwise equal qualifications, preference will be given to students from Inverness County. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Chicken Producers Association of Nova Scotia Bursary**

The Chicken Producers Association of Nova Scotia \$1000 bursary is awarded to a Nova Scotia student at NSAC who shows a demonstrated interest in pursuing the study of poultry. Preference will be given to applicants with a farming background. Students in all years of study are eligible. A student may not receive this scholarship more than once. A letter of application must be submitted not later than September 20 to:

Secretary  
Chicken Producers Association of Nova Scotia  
Agricultural Centre  
Kentville, Nova Scotia B4N 1J5

**Donald E. Clark Memorial Scholarship**

In memory of Donald E. Clark, former Professor and Head of the Agricultural Engineering Department, one or more scholarships (with total value of \$600) are awarded to final-year students in the Agricultural Engineering Department. Selection criteria include academic performance, interest, and aptitude in the engineering field. No application is required.

**Colonel Charles Coll Memorial Scholarship**

In memory of Colonel Charles H. Coll, a \$500 scholarship is awarded to a student from the Maritime Provinces in the final year of an Animal Science option. Selection criteria include academic performance, involvement and interest in poultry, and achievement and contribution to 4-H. No application is required.



**Wilfred Cyr Memorial Bursary**

The New Brunswick Sheep Breeders Association, in memory of the late Wilfred Cyr, awards a \$200 bursary to a student from New Brunswick who has completed the first year of study at NSAC. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Eastern Animal Health Technicians Association Bursary**

The Eastern Animal Health Technicians Association awards a \$100 bursary to a third-year student in the Animal Health Technology program. This bursary will be awarded to the student who best demonstrates proficiency in veterinary clinical skills during their second year and externship at the Atlantic Veterinary College. No application is required.

**Farm Focus Bursary**

The Farm Focus Bursary of \$200 is awarded to a student entering the second year of study. Selection is based on financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Kings County Federation of Agriculture Bursary**

The \$500 Kings County Federation of Agriculture Bursary is awarded to a resident of Kings County, NS, enrolled full-time at NSAC. Selection criteria include financial need, academic performance, and future plans for participation in the agricultural industry of Kings County. The selection will be made by the donor. Applications are available from and must be received by August 1 at the following address:

Kings County Federation of Agriculture  
P.O. Box 338  
Canning, Nova Scotia B0P 1H0

**Lunenburg County Federation of Agriculture Scholarship**

The Lunenburg County Federation of Agriculture Scholarship of \$300 is awarded to a student from Lunenburg or Queens Counties in Nova Scotia entering a second year of study at NSAC. Selection criteria include academic performance, farm or agricultural background or experience, and plans to pursue a career in the agricultural industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Joseph E. Mapplebeck Memorial Bursaries**

In memory of Joseph E. Mapplebeck, two \$500 bursaries are awarded to second-year technical students. Mr. Mapplebeck farmed for 50 years in Kings County, Nova Scotia, and regarded highly a good education. Selection criteria include financial need and genuine interest in their studies. Applications must be submitted to the NSAC Awards Office not later than September 20.

**H.A.L. McLaughlin Memorial Scholarship**

In memory of H.A.L. McLaughlin, who taught horticulture at the NSAC from 1953 to 1971, this scholarship is awarded to a student in horticulture. No application is required.

**Nova Scotia Department of Agriculture and Marketing Scholarships for Students in Technical Programs**

The Nova Scotia Department of Agriculture and Marketing awards scholarships to Nova Scotia students who are enrolled in the 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.

\$1000 will be awarded to those technical students who received \$1,000 entrance awards with averages in the previous year of 80% or higher with no failed subjects.

\$500 will be awarded to all other technical students with averages in the work of the previous year of 80% or higher with no failed subjects.

**Nova Scotia Federation of Agriculture Bursaries**

The Nova Scotia Federation of Agriculture awards two \$300 bursaries to second-year Nova Scotia students (one technical and one degree). Selection criteria include financial need and academic performance. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Nova Scotia Veterinary Medical Association Bursaries**

The Nova Scotia Veterinary Medical Association awards two \$500 bursaries to third-year students in the Animal Health Technology program. Selection criteria include financial need and academic performance. No application is required.

**Ira L. Rhodenizer Memorial Scholarship**

In memory of Ira L. Rhodenizer, the Nova Scotia Federation of Agriculture awards a \$300 scholarship to a second-year Nova Scotia student. Selection criteria include academic

performance, involvement in student affairs, and participation in the 4-H program. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Dr. Robert C. Rix Family Farm Bursary**

This bursary of \$300 is awarded to a student who enters the final year of the Farming Technology program. Selection criteria include the student's determination and dedication to the objective of operating a family farm, the extent to which the student is hard-working and conscientious, and financial need. No application is required.

**Robin Hood Multifoods Inc. Bursary**

Robin Hood Multifoods Inc., awards a \$1200 bursary to an Atlantic student entering the second year of a Business or Economics or Animal Science program. The scholarship is to encourage students to consider a career in sales and technical service in private industry. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Bruce Trenholm/Atlantic '86 Scholarship**

A \$500 prize is awarded to an Atlantic student entering the final year of any program with a Holstein farm or 4-H (Holstein calf project) background. Selection criteria include academic performance and career goals. Applications must be submitted to the NSAC Awards office not later than September 20.

**Raymond Webber Memorial Scholarship**

The Atlantic Provinces Nursery Trades Association awards a \$300 scholarship to the most promising Landscape Horticulture Technology second-year student. Selection criteria include academic performance and practical work skills. No application is required.

**Medals and Prizes**

**K. de Geus Memorial Prize for Plant Science**

In memory of the late K. de Geus, a prize is awarded to a technical graduate. Selection is based on high standing in course work and preference is given to students in the horticultural field. No application is required.



**H.J. Fraser Memorial Prize for English**

In memory of the late Professor H.J. Fraser, a prize is awarded to a second-year student who has achieved excellence in a first-year English course at NSAC. No application is required.

**Dr. Gerry W. Friars Undergraduate Research Prize**

The Dr. Gerry W. Friars Undergraduate Research Prize is awarded to the student who is judged to have completed the best written research report as part of his/her fourth-year project requirements. Dr. Friars, an NSAC Alumnus, was introduced to scientific research by an undergraduate research project. This was the beginning of a career in research and teaching. No application is required.

**Governor-General's Medals**

A silver Governor-General's Medal is awarded to the B.Sc. (Agr.) graduate who achieves the highest academic standing in the program. A bronze Governor-General's Medal is awarded to the technical graduate who achieves the highest academic standing in the program. No application is required.

**Ketchum Manufacturing Company Limited Prize**

The Ketchum Manufacturing Company Limited Prize is awarded to a graduate of the Animal Science option. No application is required.

**MTC Pharmaceuticals Prize**

MTC Pharmaceuticals (a member of Maple Leaf Foods Inc.) awards a prize to a graduate of the Animal Health Technology program at NSAC. The selection of the award is based on excellence in all aspects of the Animal Health Technology program including clinical, laboratory, and laboratory animal skills. No application is required.

**Maritime Provinces Swine Producers' Prizes**

The New Brunswick Hog Marketing Board, Prince Edward Island Quality Swine Inc., and Pork Nova Scotia jointly sponsor two Prizes. No application is required.

\$400 is awarded to a technical graduate who, through performance in the Swine Production course and in light of other swine-related endeavours, shows the best combination of academic performance and practical swine husbandry ability.

\$600 is awarded to a B.Sc. (Agr.) graduate 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.

**Nova Scotia Veterinary Medical Association Prize**

The Nova Scotia Veterinary Medical Association awards a prize of \$300 to a technical student who excelled in the animal physiology and animal health courses and who subsequently enrolls in the technology year. No application is required.

**G.G. Smeltzer Prize**

The \$300 G.G. Smeltzer Prize is awarded to a second-year student who excelled in the work of the first year Plant Science technician program. No application is required.

**R.H. Stevenson Memorial Prize for Mathematics and Physics**

In memory of the late Professor R.H. Stevenson, a prize is awarded to a second-year student who achieved excellence in the first year of Mathematics and Physics at NSAC. No application is required.

**Scholarships and Bursaries for Continuing Studies beyond the B.Sc. (Agr.) and Technical Level**

**Cobequid Dog Club Scholarship**

The Cobequid Dog Club awards a \$400 scholarship to a Nova Scotia student from the NSAC who is admitted to a veterinary college. No application is required.

**Harney Estate Scholarships**

The late Dr. Patricia Harney, Class of '48, Diploma, has bequeathed a sizeable portion of her estate to NSAC. The income from the funds is to be used to provide three scholarships for NSAC graduates to pursue graduate study at Macdonald College, McGill University, or the University of Guelph. The funds make further study possible for NSAC graduates to help preserve the long-standing links between NSAC, Macdonald College, and Guelph.

**Edith Main Memorial Bursary**

In memory of Edith Main, the auxiliary to the Nova Scotia Veterinary Medical Association

awards a \$100 bursary to a Nova Scotia student who has attended the NSAC and has been admitted to a Canadian veterinary college. No application is required.

**New Brunswick Poultry Council Scholarship**

The New Brunswick Poultry Council awards a \$500 scholarship to a student from NSAC who is admitted to a Canadian veterinary college. Preference will be given New Brunswick students. No application is required.

**NSAC Graduate Scholarships**

The NSAC awards \$5000 renewable entrance scholarships to applicants approved for admission to the NSAC/Dalhousie M.Sc. Program. Maximum eligibility for scholarships is two years. All full-time applicants to the M.Sc. Program are eligible. For further information, contact the NSAC Graduate Office.

**Nova Scotia Fur Institute Scholarship**

The Nova Scotia Fur Institute awards a \$2500 scholarship to a graduate in Animal Science from the NSAC who is pursuing graduate studies in fur production at an approved university. Selection will be based primarily on academic performance. Applications must be submitted not later than January 31 to:

Chairman  
Nova Scotia Fur Institute  
Nova Scotia Agricultural College  
Box 550, Truro, Nova Scotia B2N 5E3

**University of Maine Scholarship**

Under the agreement between the University of Maine at Orono and the NSAC, up to five Maritime students each year who have completed the second year of the B.Sc. (Agr.) program and are recommended by the 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 \$1000 per year.



## **External Scholarships and Bursaries**

### **Other Entrance Scholarships**

Although not exclusive to NSAC students, the following scholarships/awards are available to students entering NSAC:

#### **Benny Duivenvoorden Memorial Bursary**

In memory of Benny Duivenvoorden, Eastern Breeders Inc., Atlantic Branch, awards a \$500 bursary to a New Brunswick 4-H member who enters a recognized college of agriculture.

Applications must be submitted not later than August 31 to:

E.B.I. Inc., Atlantic Branch  
Box 1567  
Fredericton, New Brunswick E3B 5G2

#### **New Brunswick Institute of Agrologists Scholarship**

The NBIA awards a \$1000 scholarship to a resident of New Brunswick entering the degree program in Agriculture at a Canadian Educational Institute. The Scholarship Committee will take into consideration academic performance, participation in school and community activities, and financial need. Applications and the applicant's Grade XII certificate must be submitted not later than October 1 to:

Registrar  
New Brunswick Institute of Agrologists  
P.O. Box 3479, Station B  
Fredericton, New Brunswick E3A 5H2

### **Other Continuing Scholarships**

Although not exclusive to NSAC students, the following scholarships/awards are available to students studying at NSAC.

#### **Atlantic Golf Superintendents Association Scholarship**

The Atlantic Golf Superintendents Association Scholarship is available to residents of Atlantic Canada. Its intent is to both encourage students to pursue golf course management as a career option and to support students in enhancing their knowledge and skills for the turf industry.

Applicants must have a minimum of two summers/seasons work experience in the turf industry,

preferably be enrolled in at least the second semester of a recognized turf grass program and be presently enrolled in a minimum of a one-year program. Selection will be based on academic performance, financial need, and letters of reference. Applications must be submitted to the NSAC Awards Office not later than September 20.

**Canadian Society for Horticultural Science Scholarship**

A scholarship of \$250 is awarded to two students enrolled in a Canadian diploma program that specializes in Horticulture. Eligible institutions include members of the Canadian Association of Diploma in Agriculture Programs (CADAP) and other institutions which, in the opinion of the selection committee, provide the student with the equivalent of a two-year post-secondary Horticulture Diploma. The scholarship will be made on the basis of academic performance and class standing in the first year of the program and documentation of other relevant information including experience in horticulture. Deadline for complete applications is June 30.

**Canadian Association of Diploma in Agriculture Program Bursaries**

The Canadian Association of Diploma in Agriculture Programs awards two \$500 bursaries of \$500 each to students enrolled in Technician or Technology programs. The bursaries serve to encourage technical students to broaden their learning experience by enabling the recipients to spend one or two semesters of study at another post-secondary agricultural institution in Canada. The bursaries will be given annually to each of two students from two different CADAP institutions. Selection criteria include academic performance, a demonstrated interest in agriculture, reasons for wishing to participate, and background. Applications must be submitted not later than April 1 to:

Vice Principal, Academic and Research  
Nova Scotia Agricultural College  
P.O. Box 550  
Truro, Nova Scotia B2N 5E3

**Canadian Golf Superintendents Association Scholarships**

The Canadian Golf Superintendents Association supports CGSA member students attending educational programs as a means of enhancing their knowledge and skills for the turfgrass profession. The Scholars Fund is available to those currently enrolled in at least the second semester of a recognized turfgrass program of two years duration or longer. Selection criteria include academic performance, financial need, and the content of the application which

demonstrates the applicant's interest in the field of turfgrass as a career. Applications are due by November 30 at the following address:

Canadian Golf Superintendents Association  
5580 Explorer Drive, Suite 509  
Mississauga, Ontario L4W 4Y1

**Dairytown Products Ltd. University Scholarship**

Dairytown Products Ltd. awards a \$1000 scholarship and a summer employment opportunity for a third- or fourth-year university student to encourage them in the study of Dairy Science and/or Food Technology. Applicants must be New Brunswick residents enrolled in a science or engineering degree program at a recognized college or university. Preference will be given to a student enrolled in Dairy or Food Science studies. Selection will be based on academic performance, financial need, involvement in agriculture, and interest in dairy or food industry. Applications must include a 500 word essay, two letters of recommendation, and a transcript and be submitted not later than July 31 to:

Scholarship Committee  
Dairytown Products Ltd.  
P.O. Box 378  
Sussex, New Brunswick E0E 1P0

**Keith Gilmore Foundation Scholarships**

Three \$1500 scholarships are offered to individuals in an undergraduate or post-graduate degree program in agriculture, journalism, or communications at a recognized university. The successful applicant will already have completed a minimum of one year in his/her major field of studies.

Three \$500 scholarships are offered to individuals enrolled in a recognized diploma program in agriculture and/or journalism or communications. The successful applicant will have already completed a minimum of one year in a diploma program.

Applications are available at the NSAC Awards Office and should be submitted not later than July 1 to:

The Keith Gilmore Foundation  
5160 Skyline Way N.E.  
Calgary, Alberta T2E 6V1



### **Holstein Association of Canada Scholarships**

Holstein Canada awards two \$1000 scholarships to post-secondary students in Canada. Applicants must have completed at least one year of college/university and maintained a minimum average of 70% in the year of application. To be eligible, applicants must be a regular or junior member of Holstein Canada or a son/daughter of a member. Selection criteria include academic performance, future goals, 4-H experience and farm background. Applications are available from and must be received by June 22 at the following address:

Jane N. Whaley, Promotion Manager  
Holstein Association of Canada  
P.O. Box 610, Brantford, Ontario N3T 5R4

### **Arlen Kerr Memorial Scholarship**

The Canada Mink Breeders Association awards a \$1200 renewable scholarship to Canadian graduate students engaged in Mink Research attending any Canadian University or Veterinary College. Applicants should submit their education profile and research proposal by January 15 to:

Karlene Hart, Executive Secretary  
Canada Mink Breeders Association  
65 Skyway Ave., Suite B  
Rexdale, Ontario M9W 6C7

### **George B. Whalen Memorial Scholarship**

The New Brunswick Milk Marketing Board awards a \$750 scholarship in memory of George B. Whalen, who dedicated a great part of his life to the promotion of a more viable dairy industry in New Brunswick. Applicants must be New Brunswick residents enrolled in the second, third, or fourth year of study in a university degree program relating to agriculture or the dairy industry. Areas of study may include, but are not necessarily limited to, plant and animal science, agricultural engineering, veterinary medicine, agricultural economics, etc. Selection will be based on financial need, academic performance, involvement in community, and future plans. Applications including a 300-500 word essay, two letters of recommendation, and a transcript of marks must be submitted not later than June 24 to:

Scholarship Committee  
New Brunswick Milk Marketing Board  
P.O. Box 490  
Sussex, New Brunswick E0E 1P0









**Nova Scotia  
Agricultural  
College**

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

(902) 893-NSAC

JOANNE CAMPBELL  
LIBRARY